CATALOGUE OF ELECTROPHORETIC SPECTRA OF GLIADINS AND GLUTENIN SUBUNITS WITH HIGH MOLECULAR WEIGHT (HMW) IN VARIETIES OF WORLD COLLECTION OF WINTER WHEAT (*T. AESTIVUM* L.)

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The catalogue of electrophoretic spectra or a set of allelic blocks of gliadin zones and glutenin subunits with high molecular weight separated from them includes 201 common wheat varieties originating from humid regions of Europe, 157 varieties from arid European regions and 35 American, Asian or Australian varieties, respectively. The catalogue gives information in a fundamental way on pedigree, sedimentation values, presence of Rht-genes and Vrn--genes and resistance to winter killing and diseases.

common wheat; foreign winter varieties; catalogue; gliadins; glutenins

Signal genes determining the structure of gliadin and glutenin proteins of wheat grain marker some important economic characteristics of wheat, such as baking quality, resistance to frost and stem rust (Č e r n ý et al., 1990). Simultaneously according to the degree of protein polymorphism finding through the electrophoretic analysis of gliadins and glutenin subunits with high molecular weight (VHM) the genetic structure of assessed varieties can be evaluated and separated individual protein lines from varieties-populations distinct possibly by agronomic value (Š a š e k et al., 1985). Model electrophoretic spectra of gliadins and glutenin subunits of high molecular weight (HMW) of different varieties and new breeds of common wheat enable objective and fast determination of varietal purity in a grain sample substituting long-term vegetation tests (Č e r n ý et al., 1989, 1990; Š a š e k et al., 1989).

Taking into consideration the said importance of signal, gliadin and glutenin genes for breeding, seed production, purchase and processing of wheat, the catalogue of electrophoretic spectra of gliadins and glutenins of high molecular weight of 46 foreign varieties of spring wheat (Š a š e k et al., 1991a) and 166 foreign varieties of winter wheat (Š a š e k et al., 1991b) was published. The presented innovated catalogue of electrophoretic spectra of gliadins and glutenin subunits of high molecular weight includes in total 201 common wheat varieties from humid regions of Europe, 157 varieties from arid regions of Europe and 35 American or Asian and Australian varieties, respectively.

Innovation of the catalogue does not concern only extension of a number of analyzed varieties and records of newly occurred alleles of signal protein genes but supplementation of the catalogue by the data of sedimentation value of different varieties and references to pedigree, presence of genes determining ontogenetic development (Rht-genes, Vrn-genes) and resistance to winter killing (Š k o r p í k et al., 1991).

MATERIAL AND METHODS

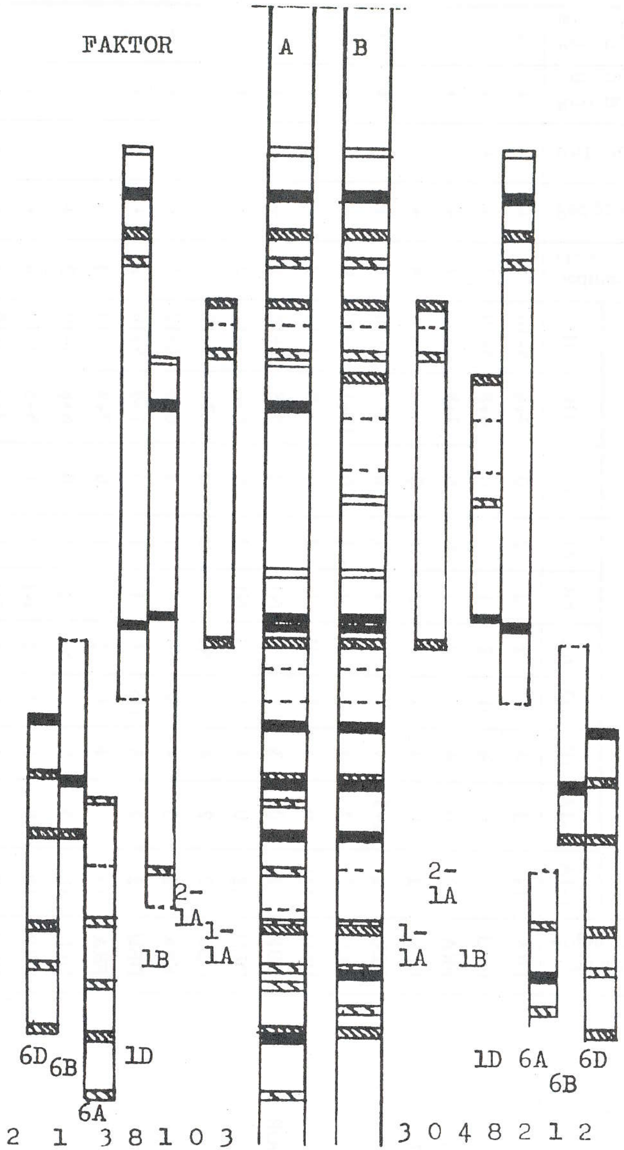
The set of 393 winter wheat varieties, bred and cultivated in the above-mentioned regions of Europe or from abroad, resp., was evaluated. Evaluated varieties were included in the collection of common wheat varieties of the Research Institute for Crop Production in Prague-Ruzyně in the years 1988–1991.

A survey of evaluated varieties is in Tabs. I, II and III. 25 grains or 3 grains were taken from each variety from bulk samples to determine electrophoretic structure of gliadins or glutenins of high molecular weight, respectively.

Electrophoretic spectra of gliadins were determined by modified procedure of vertical electrophoresis in columns of starch gel in Al-lactate buffer at pH 3.1 with 2 mol/l of urea. Allelic gliadin blocks were separated from electrophoretic spectra of gliadins according to the catalogue of gliadin allelic blocks (Š a š e k , S ý k o r o v á , 1989). An example for separation of allelic blocks from achieved electrophoretic spectra are daughters' lines of the variety FAKTOR (Fig. 1).

Electrophoretic spectra of glutenins of high molecular weight were determined by the modified procedure of vertical discontinual electrophoresis in polyacrylamide gel in presence of sodium dodecyl sulphate (L a e m m l i , 1970). Allelic blocks of zones or individual zones of subunits of glutenins with high molecular weight were settled according to the published catalogue (P a y n e et al., 1981).

Baking quality of analyzed varieties was judged by the SDS sedimentation test (H ý ž a , 1986). The values of sedimentation test are expressed by 9-point scale where 1 – lowest and 9 – highest value of sedimentation or baking quality, respectively.



1. Separation of allelic blocks of zones determined by genes located on chromosomes 1A (two loci), 1B, 1D, 6A, 6B, 6D from electrophoretic gliadin spectra of sister lines (A, B) of the FACTOR variety

I. Verification of wheat varieties of humid regions of Europe by gliadin and glutenin markers

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
ABOUKIR	FRA	13	3	4	1	2	2	2	0	7+8	5+10	4	+		+	+
ADULAR	DEU	2	0	4	1	2	1	2	0	6+8	5+10	7	+	+	+	
ALBATROS	FRA	2	0	4	1	2	2	N	0	7+8	2+12	7	+		+	+
ALBRECHT	DEU	2	0	3	1	3	2	1	0	6+8	5+10	4	+		+	
ALCEDO	DEU	2	2+3	5	5	3	1	1	0	7+9	5+10	7	+		+	+
ALIDOS	DEU	2	2	4	8	3	1	1	0	17+18	5+10	9	+		+	+
ALMUS	DEU	(7)	0	3	2	N1	1	2	0	7+9	2+12	7	+		+	+
AMBASADOR	GBR	2	0	3	1	2	N1	1	0	6+8	2+12	2	+		+	
APOLLO	DEU	2	0	3	1	N1	N1	2	0	6+8	2+12	2	+	+	+	+
AQUILA	GBR	2	2	4	1	N1	1	2	0	7	2+12		+			+
ARES	FRA	2	0	4	8	N1	1	1	0	6+8	2+12	5	+		+	+
ARKOS	DEU	2	2	5	(5)	3	1	1	0	7+9	5+10	8	+		+	+
ARMUR	FRA	13	0	4	1	2	1	1	0	7+9	5+10	3				
AUTHARI	DEU	10	3	5	9	N1	1	1	0	6+8	5+10	2	+			
AVALON	GBR	10	0	1	2	2	N1	2	1	6+8	2+12	6	+	+	+	+
AVIR	NLD	9	0	4	1	2	N1	1	0	7+9	5+10	8	+	+	+	+
AXEL	FRA	2	0	4	1	2	2	1	0	7+8	2+12	7	+		+	+
BANNER	GBR	2	0	3	1	2	2	2	0	6+8	2+12	4	+		+	
BEAVER	GBR	4	0	3	1	N1	1	(2)	0	6+8	2+12		+	+		
BELAVISO	FRA	2	0	3	1	2	1	N1	0	7+8	2+12	2				
BERNINE	CHE	9	0	3	8	N1	1	2	0	7+8	5+10	3	+		+	
BLAUCHAMP	FRA	2	0	4	1	2	N1	N1	0	6+8	2+12	4	+			
BORENOS	DEU	14	3	5	5	3	1	1	0	7+9	2+12	6	+		+	+
BOTRI	DEU	2	3	4	8	2	1	1	0	7+9	2+12	4	+		+	
BOUNTY	GBR	2	0	4	2	2	1	1	0	7+9	2+12	4	+	+	+	+
BOXER	GBR	4	3	4	3	2	1	1	1	6+8	2+12	6	+		+	
BRIGAND	GBR	10	0	4	1	2	N2	2	0	6+8	2+12	2	+	+	+	+
BRIMSTONE	GBR	(5)	0	4	2	2	1	1	0	6+8	2+12	7	+		+	+
BROCK	GBR	4	3	4	1	2	1	2	0	7	4+12	2	+		+	+
BUSSARD	DEU	9	0	4	1	N1	2	1	1	7+9	5+10		+	+		+
CAMP REMY	FRA	2	(3)	4	(2)	2	2	1	0	7	4+12	4				
CARIBO	DEU	9	(1)	4	(2)	N1	1	2	0	7	2+12	4	+		+	+
CAROLUS	DEU	9	0	4	4	N1	N1	2	1	7	2+12	8	+		+	+
CASTAN	FRA	N1	0	1	1	2	1	1	0	7+8	4+12	4	+	+	+	+
CEBEKO 79	NLD	1	1	13	10	N2	1	1	2[x]	7+8	3+12	6				
CHAMPION	FRA	13	2	4	4	2	1	N1	0	6+8	2+12	3	+		+	
CHAMPLEIN	FRA	9	2	4	1	2	2	1	0	7+8	3+12	5	+		+	
CHOPIN	FRA	9	2	2	1	2	1	N1	1	7+9	5+10	7				
CITADEL	NLD	3	(3)	4	2	1	1	1	0	7+9	5+10	1			+	+
CLEMENT	NLD	3	0	3	1	2	N1	1	0	7+9	5+10	5	+		+	+
COCAGNE	FRA	9	2	4	1	2	1	2	0	7+9	2+12	3	+			+
COMPAL	DEU	(5)	3	4	3	2	1	1	1	7+8	2+12	6			+	+

Continuation of Tab. I

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
CONSUL	DEU	9	2	4	6	2	1	1	0	7+8	2+12	2	+			
CONTRA	DEU	4	0	4	9	3	1	(1)	0	6+8	2+12		+	+		
COURTOT	FRA	9	0	4	1	N2	1	1	0	7+8	2+12	8	+	+	+	+
CRYSTAL	DEU	4	2	4	(2)	2	2	N	1	7+9	5+10	4				
CWW 1724/314	GBR	4	3	4	1	2	1	2	0	6+8	2+12	1	+		+	+
CWW 3474/1	GBR	2	0	4	1	N1	N1	2	0	6+8	2+12	8	+	+	+	
DAMIER	FRA	3	0	3	1	2	N1	1	0	6+8	2+12	1	+			
DARTAGNAN	FRA	13	3	4	9	2	2	1	0	7	5+10	6	+			
DAVIDOC	FRA	9	0	4	1	2	1	1	1	7+8	2+12	5	+	+		
DECIBEL	GBR	2	0	4	8	N1	1	2	0	6+8	2+12	3	+		+	
DECLIC	FRA	2	0	1	9	2	1	1	0	7+8	2+12	4	+			
DIANA	SWE	9	0	5	N2	2	1	1	1	6+8	2+12	1	+			
DOLOMIT	DEU	2	0	4	1	2	1	1	0	7+9	5+10	8	+	+	+	+
DOZENT	DEU	9	1	3	2	N1	N1	2	0	7+8	2+12	6			+	+
DRIAM	FRA	2	0	4	1	2	1	N1	0	7+8	2+12	7				
ELOI	FRA	2	0	4	1	N1	(3)	2	0	6+8	5+10	6				
EMIKA	POL	3	2	4	5	2	1	1	1	6+8	2+12	5	+		+	+
EROS	DEU	6	3	4	1	N2	1	2	0	7+9	2+12	2	+			+

Variety	Country of origin	1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D	Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
ETOILE DE CHOISY	FRA	2	0	9	2	2	N2	1	0	7+8	2+12	4	+		+	+
FAKIR	DEU	3	2+3	4	8+7	2	1	2	0	7+9	2+12 5+10	4	+	+	+	+
FAKTA	DEU	3	2	1	1	2	1	2	0	7	2+12	3	+		+	+
FAKTOR	DEU	3	0	1+4	8	3+2	1	2	1	7+9	5+10	6	+	+	+	+
FANAL	DEU	2	0	4	8	N1	1	1	0	6+8	2+12	4	+			+
FELIX	DEU	10	0	12	1	N1	1	2	0	6+8	5+10	3	+			
FENMAN	GBR	9	0	4	1	N1	N1	1	0	6+8	2+12	2	+	+	+	+
FESTIVAL	FRA	4	0	1	2	2	2	1	0	20	5+10	3	+	+		
FIDEL	FRA	1	2+3	13	7	2	2	N1	0	7+8	5+10	2	+	+	+	
FLORIAN	FRA	2	0	4	1	N1	1	1	1	7+8	5+10	7				
FLORIDA	DEU	9	0	3	1	N1	1	2	1	6+8	5+10	4			+	+
FLORIN	FRA	9	3	4	1	2	1	1	0	7+8	3+12	7				
FREGATT	DEU	2	0	4	1	N1	1	2	1	7+9	2+12	7	+	+		
FRIEDLAND	FRA	9	0	4	1	1	1	N1	0	6+8	5+10	6	+			
FRÜHGOLD	DEU	2	0	4	8	2	1	2	0	7+8	5+10	3	+			+
FRÜHPROBST	DEU	2	0	4	1	1	2	1	0	7+9	5+10	6–9	+		+	
FUTUR	DEU	9	0	4	1	N1	1	2	0	7+8	2+12	6	+		+	+
GALA	FRA	2	0	4	2	2	1	1	0	7+8	4+12	8	+		+	+
GALAHAD	GBR	4	0	4	1	(1)	1	2	0	7+8	2+12	3	+	+	+	+
GOYA	NLD		3		N2	3	1	1	0	6+8	5+10	1	+		+	
GRANA	POL	9	2	4	2	1	1	1	0	7+8	2+12	2	+		+	+
GRANADA	DEU	9	1	3	1	N1	1	N2	0	6+8	5+10	3	+		+	+
GRANIT	DEU	10	1	8	2	3	1	1	1	7+9	5+10	4	+		+	+

Continuation of Tab. I

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
GRANTA	GBR	9	0	4	8	2	1	2	0	6+8	2+12	3				
HADEN	FRA	0	3	4	(2)	N1	1	8	2^x	14+15	3+12	6				
HAI	DEU	2	0	4	1	2	N1	2	0	6+8	2+12	1	+	+		
HARDI	FRA	2	(0)	4	1	1	(2)	1	0	7	2+12	8	+			
HAINES VII	DEU	2	(1)	4	1	2	1	1	0	6+8	2+12	2	+			+
HEINRICH	DEU	9	0	3	1	N1	1	2	0	7	2+12	2			+	+
HERZOG	DEU	2	0	3	1	N1	2	2	0	7+9	2+12	6	+		+	+
HEUTERBISE	FRA	8	2+3	5	1	N2	1	1	0	7	2+12	3	+			
HILDUR	SWE	2	0	1	7	(2)	3	1	2^x	7+9	5+10	4				
HORNET	GBR	4	0	3	1	3	N1	2	0	6+8	2+12	7	+	+	+	+
IENA	FRA	9	3	1	1	2	2	1	0	7+9	3+12	6	+			
JAGUAR	DEU	2	(0)	5	1	(2)	1	1	0	6+8	2+12	6	+		+	+
JANA	POL	9	2	4	8	2	1	1	0	7+8	2+12	5				+
JAWA	POL	10	2	4	1	2	N1	1	0	7	2+12	4	+		+	+
JOSS CAMBIER	FRA	2	0	4	1	1	2	1	0	7+8	2+12	3	+		+	
JUBILAR	DEU	9	2	4	1	N2	1	1	0	6+8	5+10	4	+		+	+
JULIUS	DEU	2	0	4	1	2	2	1	0	6+8	5+10	7	+		+	
KANZLER	DEU	9	0	4	1	N2	(3)	1	0	7+8	2+12	6	+		+	+
KNIRPS	DEU	2	0	3	1	3	N1	1	0	7+8	2+12	4			+	+
KOBOLD	DEU	9	0	1	1	N2	2	1	0	6+8	5+10	3				+
KODA	POL	4	3	3	1	2	3	1	0	7+9	5+10	3	+	+	+	+
KONSUL	DEU	9	0	4	1	2	1	2	0	6+8	2+12	6	+	+		
KORMORAN	DEU	2	0	4	1	N1 2	1	2	0	7	5+10	9	+		+	+
KRAKA	DNK	2	2	4	8	N1	1	2	0	6+8	2+12	6	+		+	+
KRANICH	DEU	2	2	4	1	N2	1	1	0	6+8	2+12	6	+		+	
LINNA	FIN	9	0	1	9	2	1	1	0	7+9	2+12	6	+			+
LIWILLA	POL	2	0	4	8	2	(1)	1	0	6+8	5+10	3	+		+	+
LODI	FRA	13	0	4	1	2	2	1	0	7+8	5+10	3	+		+	+
LUNA	POL	9	2	4	1	2	1	1	0	7	2+12	2				+
LUTIN	FRA	2	0	4	1	(1)	1	N	0	7+9	2+12	6	+		+	
MAMUT	POL	2	0	3	2	2	1	1	0	6+8	2+12	1			+	+
MARIS BEACON	GBR	9	0	4	1	2	1	1	0	6+8	2+12	1	+			+
MARIS BILBO	GBR	2	3	4	1	2	N5	2	0	6+8	2+12	4			+	+
MARIS DURIN	GBR	4	0	1	1	2	N2	(1)	0	6+8	2+12				+	+
MARIS ENVOY	GBR	1	0	1	7	3	1	1	1	7+9	5+10	4	+			
MARIS FUNDIN	GBR	2	0	4	(2)	2	N5	1	0	7	2+12	4	+	+	+	+
MARIS HUNTSMAN	GBR	9	0	4	1	2	1	1	0	6+8	2+12	2	+	+	+	+
MARIS MARKSMAN	GBR	4	0	4	1	2	(2)	1	0	6+8	2+12	4	+	+	+	+
MARIS NIMROD	GBR	10	0	1	1	2	1	1	0	6+8	2+12	1	+		+	+
MARIS RANGER	GBR	3	1	4	8	N1	N4	1	0	7+8	2+12	3	+			

Continuatin of Tab. I

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
MARIS SEETLER	GBR	10	0	4	2	2	N2	2	0	6+8	2+12	1	+			+
MARIS TEMPLAR	GBR	2	0	4	1	2	1	2	0	7	2+12	3	+			+
MARIS WIDBEON	GBR	2	0	4	2	2	1	2	1	7	2+12	9	+			
MARKUS	DEU	3	2+3	4	9	N1	1	1	0	7+8	5+10	5	+			
MEGA	GBR	1	1	13	9	2	1	2	0	6+8	2+12	5	+		+	+
METEOR	GBR	10	0	4	1	2	1	2	0	6+8	2+12	4	+		+	
MEXICO 50/B21	FRA	13	3	4	7	2	1	1	0	7+8	5+10	8	+	+	+	
MIKON	DEU	3	3	1	6	3	1	2	1	7+9	5+10	7	+		+	+
MILAN	DEU	9	0	4	1	N1	1	2	0	7	2+12	7	+		+	+
MILLER	NLD	9	0	4	1	N1	1	1	0	7	2+12	6	+		+	
MIRA	POL	8	2	4	1	N1	1	1	1	6+8	2+12	4				
MIRAS	DEU	3	3	1	5	3	1	2	1	7+9	5+10	8	+	+	+	+
MITHRAS	GBR	2	0	4	9	2	1	N	0	7+8	2+12	5		+	+	
MODRA	POL	2	0	4	1	2	1	2	0	6+8	2+12	2	+		+	+
MOISSON	FRA	2	0	4	1	2	1	N1	0	7+8	2+12	5	+		+	+
MONITOR	GBR	2	0	1	8	2	1	2	0	7	2+12	1			+	
MOULIN	GBR	4	0	4	1	2	1	N1	0	17+18	2+12	5	+	+	+	+
NORDA	BEL	3	3	4	9	2	N1	2	0	6+8	2+12	1	+		+	
NORMAN	GBR	2	0	1	1	N1	N1	2	0	6+8	2+12	3	+	+	+	+
OBERST	DEU	9	0	4	1	N1	1	2	0	7+8	2+12	3	+		+	+
ODA	POL	4	0	4	1	2	N2	1	0	7+9	2+12	4	+		+	
OLYMP	DEU	9	0	3	1	N1	2	1	0	6+8	5+10	4			+	+
PAGODE	NLD	10	2	4	1	2	1	2	0	7+9	2+12	4	+	+		
PANTUS	DEU	4	0	3	8	2	2	1	1 0	7+9	2+12 5+10	9			+	+
PARADA	POL	10	0	1	9	2	1	(1)	0	6+8 7+9	2+12	5			+	+
PARADE	GBR	10	0	1	1	2	1	2	0	6+8	2+12	5	+		+	
PETREL	FRA	2+9	0	3	2	N	1	2	0	7+9	5+10		+		+	+
POROS	DEU	9	2	1	N2	1	1	1	0	7+8	2+12	4	+			+
PRESTIGE	FRA	2	0	4	1	1	1	2	0	7+9	2+12	6	+			
RABE	DEU	(0)	3	4	5	N1	1	1	1	7+8	5+10	7	+			+
RAMIRO	DEU	3	1	1	(5)	3	1	2	1	7+9	5+10	6	+		+	+
RAPIER	GBR	9	0	4	1	2	1	1	0	6+8	2+12	5	+		+	+
REAL	FRA	2	0	4	1	1	N1	1	0	7+8	2+12	6			+	
RECITAL	FRA	2	0	4	1	2	1	1	0	6+8	5+10	7				+
RECTOR	DEU	2	0	4	1	2	1	2	0	7+9	5+10	8	+		+	+
REGENT	DEU	9	0	4	6	N1	2	1	1	7+9	2+12	7	+		+	+
REMBRANT	DEU	3	0	9	1	1	1	1	0	7+8	5+10	3	+			
REMUS	DEU	3	0	1	3	3	1	2	0	6+8	2+12	1			+	+
RENDEZVOUS	GBR	4	2+1	5	1	2	2	1	1	6+8	2+12	6	+	+	+	+
RESCELER	FRA	3	0	1	1	2	1	2	0	7+9	5+10	7	+		+	+

Continuation of Tab. I

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
RIBAND	GBR	2	0	(4)	1	N1	1	1	0	6+8	2+12	3	+		+	+
ROAZON	FRA	2	0	1	2	2	1	1	0	7+8	2+12	5	+	+	+	+
ROTA	POL	2	2	1	1	2	N2	1	0	6+8	2+12	3	+		+	+
SAGA	POL	9	2	4	5	1	1	1	1	6+8	2+12 5+10	2	+		+	+
SALADIN	DEU	2	2	5	5	N1	1	1	0	7+9	5+10	4			+	+
SALWA	POL	2	2+0	4	1	1	1	1	0	7+8	2+12	3	+			+
SARNO	FRA	14	2	2	1	1	N1	1	0	6+8	2+12	5		+	+	+
SATURN	DEU	2	0	4	1	2	1	1	1	6+8	2+12	5	+			+
SIRROCO	GBR	2	0	4	2	2	1	2	0	7+9 6+8	2+12			+		
SOLEIL	FRA	9	2	4	1	2	2	N1	0	7+9	4+12	7	+			
SOLID	SWE	2	3	9	1	N1	1	1	1	6+8	2+12	2	+			+
SORBAS	DEU	10	2	4	9	2	1	2	0	7+9	2+12	4	+	+	+	
SPERBER	DEU	2	0	3	1	N1	2	2	0	6+8	2+12	6	+		+	+
STAR	DEU	3	0	1	7	N1	1	1	0	7+9	5+10	5	+		+	
STARKE II	SWE	9	2	4	1	1	1	1	0	6+8	2+12	4	+		+	
STELLA	BEL	10	4	0	N1	2	N1	1				2	+			
STRUBE 851037	DEU	9	0	3	2	2	1	1	0	6+8	2+12	1			+	

Variety	Country of origin	1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D	Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
STRUBE 861021	DEU	9	1	3	1	3	1	N	0	6+8	5+10	2			+	
SULFREN	FRA	1	2+3	4	2	(2)	1	(N1)	0	7+9	3+12	4			+	
TALENT	FRA	9	2	4	N2	2	2	N1	0	7+9	2+12	2	+		+	+
TARAS	DEU	4	2	5	9	3	1	2+N	0	7+9	5+10	5	+		+	+
TAW 12399/75	DEU	2	0	3	N2	N	(1)	N1	0	7+9	5+10	4			+	+
TITUS	DEU	2+4	0	4	1	2	1	2	0	7+9	5+10	6	+		+	
TJB 99/15	GBR	2	0	4	1	N1	1	2	0	20	2+12	4			+	
TOM POURCE BARBU ROUGE	FRA	(10)	1	15	9	2	1	1	2^x 0	7+8 20	4+12 2+12	3		+		
TOM POURCE BLANC	FRA	9+1	0+3	9	3	2	1	1	0	20	5+10	4		+		
TORFRIDA	GBR	4	2+N	4	9	2	2	1	1	17+18	5+10					
TORONTO	DEU	10	0	3	N2	2	1	1	0	7+9	5+10	6	+	+		
URBAN	DEU	9	2	4	8	N2	2	1	0	7+9	5+10	7	+		+	+
VAKKA	FIN	9	0	1	9	3	1	1	0	7+9	5+10	3	+			
VAL	BEL	1	1	15	1	1	1	2	0	20	2+12	2	+			
VARMA	FIN	9	0	1	9	2	1	1	1	7+9	2+12	2	+			
VOYAGE	GBR	6	0	3	1	2	2	1	0	6+8	2+12	1	+	+	+	
VUKA	DEU	10	0	4	1	N1	1	1	0	7+9	5+10	6			+	+
WALDE	SWE	9	2	4	9	2	3	1	2^x	6+8	3+12	3	+		+	
WEIHENSTEPHAN 278	DEU	2	0	3	2	1	3	1	0	6+8	2+12	2				
ZENTOS	DEU	3	2+3	4	5	3	1	2	0	7+9	5+10	7	+	+		+

II. Verification of wheat varieties of arid regions of Europe by gliadin and glutenin markers

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
ABANO	ITA	2	2	2	2	2	1	8	0	7+9	2+12	4				
AGRON	AUT	4	1	1	(2)	(1)	1	1	1	7+9	5+10	7	+		+	
ALBATROS ODESSKIJ	SUN	4	3	1	5	N1	2	1	1	7+8	5+10	7			+	
ARIESON	ROM	4	1	1	5	2	1	1	1	7+8	5+10	4	+		+	
ARONA	ITA	4	0	1	2	2	2	8	0	7	2+12	7				
AURORA	SUN	3	(1)	3	2	(1)	1	1	0	7+9	5+10	4		+	+	
AZERBAJDZANSK. 1	SUN	1	3	1	5	2	1	1	0	7	5+10	5	+			
BALKAN	BGR	3	0	3	2	1	1	1	0	7+9	5+10	7	+			
BELČANKA 2	SUN	4	0	4	5	3	(2)	1	0	7+9	5+10	7				
BELČANKA 3	SUN	(5)	1	4	N2	2	1	1	0	7+8	5+10	6				
BELČANKA 4	SUN	(5)	0	1	1	1	1	1	1	7+9	5+10	7				
BELČANKA 5	SUN	4	0	4	5	1	1	1	1	7+8	5+10	6				
BELČANKA 6	SUN	3	(0)	1	1	3	N	(1)	0	7+9	5+10	6				
BELČANKA 7	SUN	4	1	1	1	1	1	1	0	7+9	5+10	6				
BELOCERKOVSKAJA 23	SUN	(5)	1	13	8	1	1	1	0	6+8	2+12	3	+			
BEZOSTAJA 1	SUN	4	1	1	1	1	1	1	0	7+9	5+10	9	+		+	+
BEZOSTAJA 2	SUN	4	0	3	2	1	1	1	0	7+9	5+10	5	+		+	+
BISERKA	YUG	2	2	2	1	(1)	2	1	0	7+9	5+10	6	+	+		+

Variety	Country of origin	1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D	Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
BONONYA	BGR	4	0	4	9	2	1	N1	0	6+8	4+12	5	+		+	
BRANKA	YUG	4	3	4	2	2	1	1	1	6+8	2+12	4			+	
BROKAT	AUT	2	0+3	1	1	2	1	1	0	6+8	5+10	6	+		+	+
CHARKOVSKAJA 90	SUN	4	1	1	5+1	(1)	3	1	1	7+9	5+10	5				
CONCORDIA	ITA	(0)	3	4	3	2	1	1	0	7+8	2+12	2				
CONCORDINO	ITA	(0)	3	4	2	2	1	1	1	7+8	2+12	2				
CONTE MARZOTO	ITA	(0)	3	4	2	2	2	1	0	20	2+12	2				
CONSTANTE	ITA	2	(3)	4	2	2	2	8	1	7+9	2+12	3				
CONSTANTINO	ITA	0	0	9	2	2	2	8	1	7	2+12					
ČAJKA	SUN	2	0	1	1	3	2	1	1	7+9	5+10	5	+			
ČERNOMORSKAJA	SUN	4	1	1	7	(1)	1	1	0	7+9	5+10	6	+			
DAKOVČANKA	YUG	4	3	4	1	2	1	1	1	6+8	2+12	4			+	
DNĚPROVSKAJA 775	SUN	4	0	1	1	3	1	1	0	7+9	5+10	7				
DNESTRANKA	SUN	4	1	1	1	2	2	1	1	7+9	5+10	8				
DNESTROVSKAJA 25	SUN	4	1	1	1	2	2	1	0	7+9	5+10	8				
DONSKAJA BEZOSTAJA	SUN	3	1	1	5	3+1	1	2	1	7+9	5+10	5	+		+	+
DONSKAJA POLUINTENZIVN.	SUN	3	1	1	9	(3)	1	1	1	7+9	5+10	7			+	
DONSKAJA POLUKARLIK.	SUN	4	2	2	N2	(3)	1	1	1	7+9	5+10	3	+	+		
DOTNUVSKAJA 458	SUN	1	0	13	1	2	1	1	0	7+9	2+12	4	+			
DUALON	SUN	14	3	1+3	1	(1)	1	1	1	7+9	5+10	6				
DUKAT	YUG	3	0	3	2	N1	1	1	2^x	7+9	4+12	4	+		+	

Continuation of Tab. II

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
ERITHROSPERMUM 264	SUN	(5)	0	1	5	3	1	2	1	7+9	5+10	6	+			
ERITHROSPERMUM 1034/79	SUN	2	0	1	2	3	2	1	1	7+8	5+10	9			+	+
FALCHETTO 222	ITA	3	3	1	1	(1)	1	1	0	7+9	5+10	3	+			
FARNESE	ITA	(0)	3	4	2	2	1	1	0	20	2+12	7	+	+		
FIORELLO	ITA	(5)	(0)	8	1	(1)	1	1	0	7+8	2+12		+			
FORTUNATO	ITA	14	1	1	1	N	1	N	0	7	5+10	4	+			
FULGERO	ITA	2	3	4	N2	N2	2	8	0	7	2+12	4				
FUNDULEA 4	ROM	(3)	3	3	1	3	1	1	0	7+9	5+10	4	+	+	+	+
FUNDULEA 29	ROM	15	3	3	2	1	1	1	1+0	7+9	5+10	4	+		+	+
FUNDULEA 33	ROM	2	2+3	4	2	3	2	1	2^x	7+9	5+10	8	+	+	+	+
FUNONE	ITA	0	3	4	2	2	1	1	1	7+8	2+12	4	+			
FUNOTTO	ITA	2	0	4	1	1	1	1	0	20	5+10	4	+			
GARIBALDINO	ITA	4+9	3	4	2	2	1	1	0	6+8	2+12	3				
GIBRID 5+	SUN	1	1	1	5	2	1	2	1	7+9	5+10	8	+			
GK BASA	HUN	13	(0)	1	1	2	3	1	0	7+8	5+10	6	+		+	
GK BENCE	HUN	3	3	3	1	2	1	1	1	7+9	5+10	4	+		+	
GK KORANI	HUN	2	2+3	14	9	2	1	1	0	7+9	2+12	4			+	
GK LILLI	HUN	(5)	3	4	1	2	1	1	1	7+8	5+10	7			+	
GK NAPHENY	HUN	(5)	0+2	4+7	7	(1)	1	1	1	7+9	5+10	6			+	
GK ÖRZE	HUN	(5)	3	4	1	2	1	1	0	6+8	2+12	3	+			
GK ÖT HALOM	HUN	7	0	1	5	2	1	1	1	7+9	5+10	6	+	+	+	+
GK TAPE	HUN	(4)	3	14	5	N1	1	2	0	7+9	5+10	7			+	
GK ZOMBOR	HUN	4	0	3	1	(1)	1	1	0	7+9	2+12	3	+		+	
GLUTINOZO	ITA	0	3	8	3	N2	2	8	1	20	2+12	3				
HEIDUCK	AUT	4	0	4	1	2	3	1	0	6+8	5+10	5	+	+	+	
IKARUS	AUT	9	1	3	1	3	2	(1)	0	6+8	5+10	4	+		+	+
ILJIČOVKA	SUN	3	3	1	1	(1)	1	2	1	7+9	5+10	9	+		+	+
IRNERIO	ITA	4	0	4	1	2	1	1	1	7+8	5+10	6	+	+	+	
IVANOVSKAJA 12	SUN	4	0	1	1	(1)	1	1	0	7+9	5+10	7	+		+	+
JAKOS. ODESSKIJ	SUN	4	(3)	1	4	N1	1	2	0	7+8	5+10	6			+	
JANTAR	BGR	3	0	1	7	3	1	2	1	7+9	5+10	6	+		+	+
JUBILEJNAJA 50	SUN	4+12	1	1	5	3	1	2	0	7+9	5+10	8	+		+	+
JUGOSLAVIA	YUG	10	(3)	3	(2)	1	1	1	0	7+9	5+10	4	+	+	+	+
JUŽANKA	SUN	4+1	0	1	1+5	1+3	1+2	1	1	7+9	5+10	5	+			
JUŽNAJA ZARJA	SUN	4	1+3	2+1	2	3	2	1	1	7+9	5+10	4	+			+
KARLIK 1	SUN	4	1	1	1	(1)	1	1	0	7+9	5+10	8	+	+	+	
KAVKAZ	SUN	4	(3)	3	2	(1)	1	1	0	7+9	5+10	5	+	+	+	+
KIJEVSKAJA 893	SUN	0	3	1	5	3	1	2	1	7+9	5+10	9	+			
KITEN	BGR	0	3	1	1	2	3	1	0	7+9	2+12	5	+		+	+
KNIISH 403	SUN	4	(1)	4	3	(1)	1	1	1	7+8	5+10	3			+	+

Continuation of Tab. II

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
KOŠAVA	YUG	0	1	1	1	2	1	(2)	0	7+9	5+10	7		+	+	
KRASNODARSKAJA 6	SUN	4	3	1	3	(1)	1	N	0	6+8 7+9	2+12	6	+			
KRIMICA	SUN	2	2	1	2	3	(3)	1	0	7+8	5+10	7	+	+	+	
KUBANSKAJA 131	SUN	4	2+3	1	4	1	1	N	0	7+9	2+12	6	+			
LAN	SUN	2	0	1	1	3	2	1	0	7+9	5+10	3	+	+	+	+
LEONARDO	ITA	4	0	8	2	2	1	1	1	20	2+12	3	+			
LESOSTEPKA 75	SUN	8	3	13	4	3	1	2	1	7+9	2+12	9	+			
LONJA	YUG	4	3	4	2	1	1	1	1	13+19	2+12	3	+	+	+	
LORETO	ITA	0	3	9	9	(1)	1	N1	1	17+18	2+12	8			+	
MAGNIFICO	ITA	2	0	4	2	2	2	(2)	0	7	2+12	4			+	
MAGNUS	AUT	13	0	4	1	2	1	(1)	0	7+9	5+10	3			+	
MARIJANA	YUG	1	2+3	4	7	3	1	1	0	7+9	5+10	2			+	+
MARTIN	AUT	2	0	4	1	2	1	2	0	7+9	5+10	8	+		+	+
MARTONVASARI	HUN	4	1	1	N2	1	1	1	0	7+9	5+10	5	+	+	+	+
MV 12	HUN	4	1	1	1	(1)	1	1	0	7+9	5+10	8	+	+	+	
MV 16	HUN	3	3	3	(2)	2	1	1	1	7+9	5+10	4	+	+	+	+
MEČTA 1	SUN	4	0	3	3	(1)	3	2	0	7+9	5+10	6	+		+	
MEČTA 2	SUN	10	0	1	1	2	1	1	0	7+8	2+12	6				
MIRONOVSKAJA 10	SUN	3	3	3	5	3	1	1	1	N1	5+10	5	+	+	+	+
MIRONOVSKAJA 26	SUN	4	0	3	5	1	1	1	1	7+9	5+10	7				
MIRONOVSKAJA 27	SUN	10+4	2+3	1	1	3	1	1	2^x	7+9	5+10	5	+	+	+	
MIRONOVSKAJA 90	SUN	2	0	1+3	1	3+1	2+1	1	1	7+9	5+10	4–7			+	
MIRONOVSKAJA 264	SUN	0	1	1	5	3	1	2	1	7+9	5+10	6	+			
MIRONOVSKAJA 808	SUN	3	(3)	1	5	3	1	2	1	7+9	5+10	9	+	+	+	+
M. JUBIL. 50	SUN	12	(0)	1	5	3	1	2	0	7+9	5+10	8	+		+	+
M. NÍZKOROS.	SUN	3	(3)	3	5	3	1	1	1	N1	5+10	4	+	+		
MIZIJA	BGR	4+1	0	1	5	2	1	1	2^x	7+9	4+12				+	
NADZEJA	SUN	3	1	1	1	3	1	2	1	7+9	5+10	7	+		+	
NIZIJA	YUG	4	1	1	7	1	1	1	2^x	7+9	3+12	5	+	+	+	+
NOVOSADSKA BRKULIA	YUG	0	0	3	2	(1)	1	1	1	7+9	5+10	4			+	
N. RANA 1	YUG	5	0	1	2	2	1	1	0	N	2+12	5	+	+		
N. RANA 2	YUG	4	0	1	2	2	1	1	0	7	2+12	5	+	+	+	+
NOVOUKRAJINSKA 83	SUN	6	0	1	3	2	1	2	1	7+9	5+10		+			
NOVOUKRAJINSKA 84	SUN	6	0	1	3	3	1	2	0+1	7+9	2+12 5+10	7	+			
NS 732	YUG	6	0	1	1	2	1	2	0	7+8	2+12	4				
NS 735	YUG	6	0	1	1	2	1	1	0	7+8	2+12	3				
OBRIJ	SUN	4	1	1	4	N1	1	2	0	7+8	5+10	9	+	+	+	+
ODĚSSKAJA 16	SUN	2+1	0	1	5	3	2	1	1	7+9	5+10					+
ODĚSSKAJA 51	SUN	4+2	0+1	1	1+5	3	2	1	1+0	7+9 7+8	5+10	9		+		+

Continuation of Tab. II

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
ODĚSSKAJA 75	SUN	4	1	1	1	N1+1	2	1	0	7+9	5+10	3	+	+	+	+
ODESSKAJA POLUKARLIKOVAJA	SUN	4	1	1	5+1	(1)	2	1	0	7+9	5+10	7	+	+	+	+
OLVIJA	SUN	4	3	4	10	N1	(2)	1	0	7+9	5+10	7	+		+	
OLYMPIA	SUN	4	1	1	N2	3	1	1	0	7+9	5+10	8	+		+	+
OMSKAJA 9	SUN	3	0	1	1	2	1	2	2^x	7+9	3+12		+			
ORLANDI	ITA	1	0	9	1	2	1	N	0	7+8	2+12	3				
OSTISTAJA 3	SUN	4	3	1	1	1	N2	1	1	7+9	5+10	7			+	
PERESVET	SUN	4+12	0	1	1	1	1	1	0	7+9	5+10	7	+	+	+	+
PERVENEC	SUN	4	1	1	9	2	1	1	1	21	2+12		+			
PITICUL	SUN	4	1	1	1	3	2	1	0	7+9	5+10	8	+	+	+	
PITONINA	YUG	10	1+2	13	7	N2	1	2	1	7+9	2+12	8			+	
PODUNAVKA	YUG	4	1	1	9	(1)	1	1	0	7+9	5+10	3		+	+	
POLESSKAJA 70	SUN	4	0	4	1	(1)	1	1	0	7	2+12	6	+		+	+
POLESSKAJA 80	SUN	3	2+3	4	3	(1)	1	1	1	7+8	5+10	6			+	
PRIBOJ	SUN	2	0	1	1	3	2	1	1	7+9	5+10	8		+	+	+
PRIKUBANSKAJA	SUN	6	0	1	3	1	1	1	0	7+8	2+12 5+10	7	+		+	+
PRODUTTORE	ITA	0	1	1	9	2	1	N1	0	7+8	2+12	2	+	+		
PROMETEJ	SUN	4	1	1	4	N1	1	2	0	7+8	5+10	4		+		
RADA	YUG	8	3	4	2	N1	1	1	0	7+8	2+12	6			+	
RADUGA	SUN	12+3	1	1	5	3	1	2	1	7+9	5+10	3	+		,	
RANNAJA 12	SUN	4	2	7	1	(1)	2	1	1	7+9	5+10	3	+			+
RUBIN	BGR	1	0	8	2	1	2	8	0	7+9	2+12	5				
SAN LUCA	ITA	3	2	3	8	2	1	1	0		2+12	7	+		+	
SAVA	YUG	5	3	4	N2	2	1	1	1	7+8	2+12	5	+	+	+	+
SKOROSPELKA 1	SUN	4	2	7	1	(1)	2	1	0	7+9	2+12	5	+			
SKOROSPELKA 3	SUN	2	3	9	1	N1	1	1	(1)	7+9	2+12		+			
SPEKTR	SUN	4	0	1	N2	(1)	2	1	1	7+8	5+10	8			+	
STAVROPOLSKAJA 38	SUN	2	0	1	1	3	2	1	0	7+9	5+10	8			+	
STOŽER	BGR	3	0	3	2	2	2	1	0	7+9	5+10	3			+	
TARASOVSKAJA 29	SUN	4	0	1	5	3	1	1	0	7+9	5+10	8	+		+	+
TISA	YUG	0	0	4	3	2	(2)	1	0	7+9	2+12	5		+	+	
TIVOLI	ITA	0	0	4	1	2	2	2	0	7	2+12	2				
TRAKIJA	BGR	4	0	1	1	2	1	1	0	7+9 6+8	5+10	5	+		+	+
UNA	YUG	4	1	1	1	2	2+1	8	0	7+9	5+10	7	+	+	+	
VALOR	ROM	3	3	1	5	3	1	2	1	7+9	5+10	7				
ZAGREBČANKA	YUG	4	3	4	2	2	1	2+1	0	6+8 7+8	2+12	8		+	+	+
ZAPOROŽSKAJA OLYMPIJSKAJA	SUN	4	0	1	7	(1)	1	2	0	7+9	5+10	7			+	

Continuation of Tab. II

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
ZIRKA	SUN	4	1	2	1	3	1	2	0	7+8	5+10	8	+	+	+	+
ZWEZDA	YUG	4	0	3	2+7	2	1	1	0	7+9	5+10	5	+	+	+	+

Evaluated varieties are presented in the catalogue in alphabetic order, represented by a main gliadin line where the denotation of the country of origin of evaluated varieties is as follows:

a) in Tab. I: BEL – Belgium, CHE – Switzerland, DNK – Denmark, FIN – Finland, FRA – France, GBR – Great Britain, DEU – Federal Republic of Germany, NLD – Netherlands, POL – Poland, SWE – Sweden
b) in Tab. II: AUT – Austria, BGR – Bulgaria, HUN – Hungary, ITA – Italy, ROM – Roumania, SUN – former Soviet Union
c) in Tab. III: AUS – Australia, CAN – Canada, JPN – Japan, KOR – Korea, MEX – Mexico, USA – United States of America

RESULTS

The catalogue is classified into three parts according to the origin of evaluated varieties of winter wheat. Part I (Tab. I) brings the results of electrophoretic analyses of gliadin and glutenin markers of varieties originating and cultivating predominantly in humid areas of western, central and northern Europe. Tab. II brings analogous results of analyses of varieties originating from arid regions of southern and eastern Europe. Tab. III summarizes the knowledge on electrophoretic structure of gliadins and glutenins of high molecular weight bred in America, Asia and Australia.

Evaluated varieties are verified in tables by gliadin and glutenin markers by characterized sets of allelic blocks of zones of main gliadin lines. Only in the case of close representation of sister sublines this is recorded by the presence of both alleles with the mark (+). Individual allelic gliadin and glutenin blocks of zones or individual zones of electrophoretic spectra of gliadins and glutenins of high molecular weight are characterized by the number of zones, their relative electrophoretic mobility and intensity of colouration (Tab. IV).

Data on marker values of individual alleles of gliadin genes and genes determining subunits of glutenins of high molecular weight markering baking quality, frost hardness and resistance to stem rust were published by Š a š e k et al. (1986) and Č e r n ý et al. (1990).

An advantage of the published catalogue consists in presentation of results of electrophoretic analyses of gliadins and glutenins of high molecular weight in the form of sets of allelic blocks of zones enabling genetic interpretation of spectra obtained. The catalogue in this form is a prerequisite for not only fast and objective determination of varietal authenticity and purity of individual collection samples or doses of lots and merchandising, but also a suitability of individual varieties or protein lines for transgression breeding for high baking quality or obtaining recombinations of higher baking quality,

III. Verification of American, Asian and Australian wheat varieties by gliadin and glutenin markers

Variety	Country of origin	GLD allelic blocks							GLU allelic blocks			Sedimentation (1–9)	Pedigree	RhT etc.	Resistance to stem rust	Resistance to winter killing
		1–1A	2–1A	1B	1D	6A	6B	6D	1A	1B	1D					
APOLLO	AUS	9	2	4	6	2	1	1	0	7	2+12	2	+		+	
BRONZE	USA	N1	0	13	7	N2	1	2	1	7+9	2+12	7	+		+	
COULEE	USA	4	0	2	3	1	2	1	1	7+9	5+10	4	+	+	+	
ELLA	USA	15	0	10	(9)	(1)	1	1	0	7+8	2+12	1	+			
FLORIDA 302	USA	15	0	4	1	N1	1	2	0	14+15	3+12	7			+	+
GALDVELL	USA	15	0	1	2	3	1	N	1	7+8	5+10	2				
GORDON	CAN	14	3	9	N2	3	3	N	1	7+9	2+12	7			+	
KUMUGI HANAGASA	JPN	10	0	1	2	2	1	2	0	7+8	2+12					
HOKUEI	JPN	8	1	9	3	3	(2)	1	0	6+8	2+12	1				
HOUSER	USA	4	2+3	14	3	2	1	2	0	6+8	2+12	3			+	+
LEE	USA	3	3	1	3	(1)	1	1	0	6+8	5+10	4	+		+	
MICHIGAN AMBER	USA	(13)	0	1	2	1	1	1	2^x	6+8	2+12		+		+	
MINI MANO	KOR	0	2+3	2	3	2	1	1	0	7+8	2+12	3			+	
MORO	USA	14	3	13	7	N1	1	N1	0	7+9	5+10	8	+		+	
NORIN 8	JPN	1	3	1	2	2	2	(1)	1	7+8	2+12	7	+			
NORIN 16	JPN	N	(3)	1	9	2	1	1	0	7+8	2+12	6	+	+		
NORIN 27	JPN	1	0	1	3	N1	1	1	0	7+9	2+12	3	+			
NORIN 44	JPN	4	1	1	N2	1	1	1	0	7+9	5+10	5	+	+		
NORIN 55	JPN	(5)	2	3	1	1	1	1	1	N	5+10	1	+	+		
NORIN 62	JPN	2	0	1	1	2	N6	1	1	7+8	2+12	7	+			
NORIN 67	JPN	5	0	8	2	(1)	1	1	1	14+15	5+10	5	+	+		
NORSTAR	CAN	4+9	0	3	4	2	1	1	0+1	7+9	2+12	5	+		+	
OASIS	USA	3	2+3	4	1	N1	1	2	0	7+9	2+12	4	+		+	+
OKUKOMUGI	JPN	2	0	8	2	N1	1	1	0	7+8	2+12	5		+		
PC WINTER 102	MEX	12	1	1	1	(1)	1	1	0	7+9	5+10				+	
PC WINTER 209	MEX	(4)	0	4	1	2	1	1	0	6+8	5+10	4			+	
PURDUE	USA	(5)	0	1	9	3	1	1	1	7+8	5+10	6			+	
SABRE	AUS	9	0	4	1	2	1	1	0	7+8	2+12	4	+			
SENTRY	USA	2	0	4	1	2	N2	1	1	7	2+12	4	+	+	+	
STUART	USA	6	0	1	1	2	(1)	1	0	7	2+12				+	
TAM W 105	USA	3	1+2	1	5	(1)	1	1	0	7+8	2+12	7	+		+	+
TIMPAW	USA	3	(1)	1	4	(1)	1	1	0	7+9	5+10	4			+	
WORIGA	USA	4	0	1	4	N1	(1)	2	0	7+8	5+10	7			+	
WW TOLUCA 381	MEX	4	0	3	2	2	1	1	0		2+12	3			+	
WW TOLUCA 386	MEX	9	2+3	3	9	1	1	N1	0	7+9	3+12	3			+	

IV. Characteristics of determined allelic blocks of zones of gliadins (GLD) and VHM-glutenin subunits (GLU)

Gliadin allelic block		Number of zones, their relative electrophoretic mobility (REM) and degree of intensity of colouration ()
1–1A	1	23.0(4)–27.5(4)–61.0(5)
	2	27.0(3)–30.0(1)–33.0(2)–36.5(3)–39.5(1)–60.5(3)
	3	27.0(3)–28.5(1)–31.5(2)–57.0(4)
	4	59.5(4)–76.0(1)
	5	55.5(2)–58.0(2)
	6	23.0(3)–26.0(2)–27.5(4)–30.5(2)–32.0(2)–61.0(5)
	7	27.5(2)–30.0(2)–32.5(4)–57.0(4)–60.0(3)
	8	17.5(2)–23.0(3)–27.5(4)–77.5(2)
	9	57.0(4)–78.0(3)
	10	57.0(4)
	12	27.0(3)–28.5(1)–31.5(2)–59.5(4)(
	13	27.0(3)–28.5(1)–31.5(2)
	14	23.0(3)–27.5(4)
	15	61.0(5)
	N, N1	not determined
2–1A	1	33.0(4)
	2	31.5 (4)
	3	36.0(4)
	1+3	33.0(4)–36.0(4)
	2+3	31.5(4)–36.0(4)
	N	not determined
1B	1	36.0(4)–54.0(5)–76.5(3)–79.5(1)
	2	35.5(3)–43.0(3)–45.0(3)–58.0(4)–72.0(1)–76.0(1)
	3	30.5(1)–34.5(5)–37.5(3)–42.0(5)–45.0(1)–48.5(3)–62.5(3)–66.0(3)
	4	33.5(3)–44.0(2)–54.0(5)–76.0(1)
	5	27.5(2)–32.0(1)–42.0(3)–54.0(5)
	7	33.0(3)–35.5(3)–43.0(3)–45.0(3)–58.0(4)–72.0(1)–76.0(1)
	8	27.5(2)–32.0(1)–37.5(2)–42.0(2)–46.0(1)–49.5(5)
	9	27.5(2)–32.0(1)–37.5(2)–42.0(1)–46.0(3)–49.5(5)
	10	42.0(3)–54.0(5)

Continuation of Tab. IV

Gliadin allelic block		Number of zones, their relative electrophoretic mobility (REM) and degree of intensity of colouration ()
	13	27.5(2)–32.0(1)–54.0(3)
	14	39.0(3)–43.0(3)–45.0(3)–58.0(4)–72.0(1)–76.0(1)
	15	27.5(2)–32.0(1)–43.0(2)–54.0(5)
	N	not determined
1D	1	13.5(2)–17.5(4)–21.0(3)–55.0(5)–61.5(2)
	2	17.5(4)–21.0(4)–55.0(5)–61.5(2)
	3	17.5(5)–21.0(4)–26.5(1)–38.0(1)–55.0(5)–62.0(3)
	4	12.5(3)–16.5(3)–19.0(3)–23.5(4)–55.0(5)–61.5(2)
	5	12.5(3)–16.5(3)–19.0(3)–23.5(3)–26.5(1)–38.0(1)–55.0(5)–61.5(2)
	6	17.5(4)–21.0(4)–23.0(3)–55.0(5)–61.5(2)
	7	12.5(3)–16.5(3)–19.0(3)–28.5(3)–55.0(5)–61.5(2)
	8	13.5(2)–17.5(4)–21.0(3)–23.0(3)–55.0(5)–61.5(2)
	9	13.5(2)–17.5(4)–21.0(3)–26.5(1)–38.0(1)–55.0(5)–62.0(4)
	10	12.5(3)–16.5(3)–18.0(1)–23.5(4)–55.0(5)–61.5(2)
	N1, N2	not determined
6A	1	76.5(1)–81.5(2)–85.0(2)–88.5(2)
	(1)	81.5(2)–85.5(4)–88.5(2)
	2	81.5(2)–85.0(5)–88.5(2)
	3	76.5(2)–81.5(1)–87.0(3)–91.0(4)–96.0(3)
	N1	72.5(4)–76.5(1)–86.0(3)–91.0(4)–96.0(3)
	N, N2	not determined
6B	1	56.5(1)–69.0(5)–70.5(2)–73.5(3)
	2	66.5(4)–72.0(4)
	3	58.0(1)–66.0(1)–69.5(2)–70.5(1)–73.5(3)
	N, N1, N2, N6	not determined
6D	1	63.5(3)–68.0(4)–74.0(4)–82.0(3)–85.0(3)–87.5(4)
	2	63.5(3)–68.0(4)–74.0(4)–82.0(2)–85.0(2)–90.5(3)
	8	63.5(5)–68.0(4)–74.0(4)–78.0(4)–82.0(3)–85.0(2)–87.5(4)
	N1	68.0(4)–73.5(3)–82.5(2)–86.5(2)
	N	not determined

Continuation of Tab. IV

Glutenin allelic block		
1A	1	75(4)
	2^x	85.5(3)
1 B	7+8	100(5)–113(3)
	7+9	100(5)–116(2)
	6+8	95(3)–113(3)
	7	100(5)
	17+18	153(4)–164(3)
	13+19	102(4)–105(3)
	14+15	103(4)–106(3)
	20	103(4)
	21	96(3)
	N, N1	not determined
1D	2+12	85(4)–124(4)
	3+12	86(4)–124(4)
	4+12	86.5(4)–124(4)
	5+10	88(5)–120(4)

frost hardiness and resistance to stem rust. Genetic interpretation of obtained model electrophoretic spectra of gliadins and glutenin subunits of high molecular weight are a prerequisite of rationalization of tests of distinction, uniformity and stability of common wheat during their testing for approval for cultivation or giving variety protection.

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ŠAŠEK, A. – ČERNÝ, J. – BRADOVÁ, J. – ŠKORPÍK, M. – SÝKOROVÁ, S. (Výzkumný ústav rostlinné výroby, Praha-Ruzyně, Česká republika; Česká zemědělská univerzita, Praha, Česká republika):

Katalog elektroforetických spekter gliadinů a podjednotek gluteninů s vysokou molekulovou hmotností odrůd světové kolekce ozimé pšenice (*T. aestivum* L.).

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Pro potřeby šlechtění, semenářství, nákupu a zpracování pšenice byl vypracován inovovaný katalog elektroforetických spekter gliadinů a podjednotek gluteninů s vysokou molekulovou hmotností (VMH) 201 odrůd pšenice obecné z humidních oblastí Evropy, 157 odrůd z aridních oblastí Evropy a 85 odrůd amerických, resp. asijských a australských. Katalog je doplněn údaji o sedimentační hodnotě hodnocených odrůd a odkazy na rodokmeny a přítomnost Rht-genů a Vrn-genů.

K elektroforetickým analýzám byly použity ramšové vzorky z kolekce odrůd pšenice obecné VÚRV Praha-Ruzyně. Analyzováno bylo po 25 zrnech, resp. po 3 zrnech k stanovení skladby gliadinů, resp. gluteninů s VMH.

Elektroforetická spektra gliadinů byla stanovena modifikovaným postupem vertikální elektroforézy ve sloupcích škrobového gelu s Al-laktátovým pufrem při pH 3,1 se 2 mol/l močoviny. Alelické gliadinové bloky zón byly vyčleněny z elektroforetických spekter gliadinů podle katalogu alelických gliadinových bloků (Šašek, Sýkorová, 1989).

Elektroforetická spektra gluteninů s VHM byla určena pomocí vertikální diskontinuální elektroforézy v polyakrylaminovém gelu v přítomnosti dodecylsulfátu sodného (Laemmli, 1970). Alelické bloky zón či jednotlivé zóny podjednotek gluteninů s VMH byly identifikovány podle katalogu alelických gluteninových bloků (Payne et al., 1981). Pekařská jakost byla posuzována pomocí sedimentačního testu (Hýža, 1986).

Katalog je členěn podle původu hodnocených odrůd do tří částí uvedených v tabulkových přehledech souborů gliadinových a gluteninových bloků jednotlivých hodnocených odrůd (tab. I až IV).

Použitá genetická interpretace získaných elektroforetických spekter hodnocených odrůd umožňuje rychlé a objektivní stanovení odrůdové pravosti a čistoty dávek osiv a merkantilu, racionalizaci rekombinačního šlechtění na vyšší pekařskou jakost, mrazuvzdornost a odolnost ke rzi travní, právě tak jako racionalizaci zkoušek odlišnosti, homogenity a stálosti odrůd.

pšenice obecná; zahraniční ozimé odrůdy; katalog; gliadiny; gluteniny

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