Genealogical Analysis of the Genetic Diversity in Winter Wheat Cultivars Grown in the Former Czechoslovakia and the Present Czech Republic during 1919–2001

Zdeněk STEHNO[1], Ladislav DOTLAČIL[1], Iva FABEROVÁ[1], Sergei MARTYNOV[2] and Tatiana DOBROTVORSKAYA[2]

[1]*Division of Genetics and Plant Breeding, Research Institute of Crop Production, Prague-Ruzyně, Czech Republic;* [2]*Vavilov' Research Institute of Plant Industry, Sankt-Petersburg, Russia*

Abstract: Using genealogical analysis, the genetic diversity in winter wheat cultivars registered and grown in the former Czechoslovakia and the present Czech Republic during 1919–2001 was studied. The strong increase of the diversity level since the 1970-s is based on the wide use in breeding programs of foreign materials, most of which originated in countries of Western, Central and Eastern Europe. Simultaneously a genetic erosion in the released cultivars occurred; from the 1930-s to the 1970-s, a significant number of original local ancestors was lost. The modern cultivars listed in the Czech National List of Varieties in 2000–2001 can be distinguished into clusters. The overwhelming majority of cultivars belong to two clusters of similar extent. In one of them the ancestors from Western Europe can be found, while in the second cluster ancestors from Eastern Europe dominate, mainly through cvs. Mironovskaya 808 and Bezostaya 1. An index of similarity of modern cultivars grown in the Czech Republic is approximately equal to the average between half- and quarter-sibs. Consequently, it can be concluded that the genetic diversity in winter wheat cultivars presently grown in the Czech Republic has increased in the last decades and is considered as acceptable.

Keywords: winter wheat; genetic profiles; original ancestors; genetic erosion; cluster analysis

An analysis of trends and ongoing changes of the genetic diversity among registered cultivars can be a useful tool to get information about the genetic base of the cultivars grown and to possibly change the direction of breeding programs and strategies (Devkota & Shah 1998; Moghaddan *et al*. 1998). Consequently, such knowledge can also contribute to a purposeful and pointed study and utilisation of germplasm.

Using a genealogical approach, coefficients of parentage for all pair-wise combinations of cultivars, structure of genetic profiles, average contributions of major ancestors and frequency of their presence in pedigrees can be used as indicators of genetic diversity.

The objective of this work was the study of changes in genetic diversity in cultivars of winter wheat, *Triticum aestivum* L., grown in the former Czechoslovakia and the present Czech Republic during most of the last century, to provide analyses of trends and indicate important changes during this period.

MATERIALS AND METHODS

Pedigrees of 316 winter wheat cultivars registered in the former Czechoslovakia and the present Czech Republic from 1919 until 2001 were studied. The pedigree analysis used the Information and Analytical System of Genetic Resources of Wheat GRIS3.5 (Martynov & Dobrotvorskaya 2000). The dynamics of changes in diversity over time were estimated according to genetic profiles (Martynov 1998). A genetic profile is the set of original an-

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cestors included in a fully developed pedigree of a cultivar. Ancestral contributions into the genome of a cultivar are estimated by coefficients of parentage. The pedigrees of modern cultivars can contain hundreds or thousands of ancestors. However, the top of the pedigree usually consists only of several landraces (cultivated forms developed from original populations; frequently indicated as LV-…). These original ancestors are components of genetic profiles.

The diversity of the modern winter wheat cultivars listed in the Czech National List of Varieties 2000–2001 was studied by cluster analysis (algorithm UPGMA), and Renkonen similarity indexes were calculated from genetic profiles by the formula:

$$p_{ij} = \sum \min \{x_{ki}, x_{kj}\}$$

where: x_{ki}, x_{kj} – contributions of k-th ancestor to i-th and j-th cultivar, respectively

min – minimal sum of the contributions of k-th ancestor is summarised for compared cultivars

The cluster analysis used the software package NTSYS 2.02c (Rohlf 1998).

RESULTS AND DISCUSSION

It can be assumed that the original ancestors in a set of cultivars may characterise their genetic diversity. Trends in changes of diversity over time can be traced by means of the analysis of series of matrixes $n \times m$, where n is the number of registered cultivars, and m the number of original ancestors in their genetic profiles.

To analyse the dynamics of changes of diversity over time, genetic profiles of all cultivars which were registered in the Czechoslovakia and the Czech Republic during the period 1919 to 2001 were constructed and 83 matrixes generated. This approach allowed to estimate changes in composition of original ancestors within the sets of cultivars registered in particular years. In the analysed period the pool of original ancestors of the Czechoslovak winter wheat cultivars contains 193 landraces and old varieties, including lines of unknown origin. Among them prevailed ancestors from European countries (148), including the Czechoslovakia (37), Germany (34), the former USSR (19), France (15), Hungary (14) and Sweden (10). The number of ancestors from other continents is much lower: America (17), Asia (16) and Africa (11).

Judged by the dynamics of changes in the average number of original ancestors in pedigrees of released cultivars (Figure 1), four periods could be distinguished. Each of them is characterised by different rates of changes in the pool of ancestors of Czechoslovak and Czech wheat cultivars. A small number of original ancestors per pedigree is characteristic for the first period (1919–1959), during which the average number of ancestors per cultivar increased from 1.06 to 3.42. The Shannon diversity index changed within this period from 1.41 to 2.65.

In the following period (1960–1978) the rate of growth of genetic diversity again increased considerably. The average number of original ancestors per pedigree grew from 4.3 to 12.8. The Shannon diversity index varied slightly (from 2.43 to 2.86) in particular years. For this period, the number of landraces per pedigree rose to 50. For example, the release of Bezostaya 1 in 1966 and its wide use in breeding programs had added the following landraces to the gene pool: Ukrainian landrace LV-UKR (Kiev), Banatka (UKR), Zeeuwse (NLD), Barleta (ARG), Rieti (ITA), Akakomugi (JPN) and landrace LV-URY from Uruguay. The cultivar Diana I (1960) had introduced four new original ancestors: Saumur de Mars (FRA), Gehun (IND), Ladoga and Onega (RUS). Oska (1971) contributed five other original ancestors: Czech landrace LV-Moravia, Scandinavia landraces LV-Scania, LV-Uppland, LV-SWE (from Sammet) and Schonen (SWE). Lena (1975) brought four original ancestors: English landrace LV-ENG (from Prince Albert), square head type from Norfolk, Introduction from GBR and Ghirka Spring (RUS).

The third period (1979–1994) is characterised by the highest rates of genetic diversity increase. The Shannon diversity index grew from 2.34 at the beginning of the period to 3.07 at its end. The average number of original ancestors per pedigree has increased from 13.94 to 31.13, and the pool of original ancestors has been enlarged by 56 new landraces. These changes are related to the registration in 1979 of cultivars Hela (new original ancestors are Hohenheimer-77 and Redchaff), Kormoran (White Victoria, K-8 and LV-Potissa) and Juna (Hybrid English, Rough Chaff White and Red King), in 1981 of cultivars Baranjka (Chinese Spring, Chinese 165 and *T. timopheevii*) and Košútka (Iumillo, Kenya C 9906 and Marroqui), in 1983 of cultivar Iris (Etawah, Indian G, Pusa 107, Gaza,

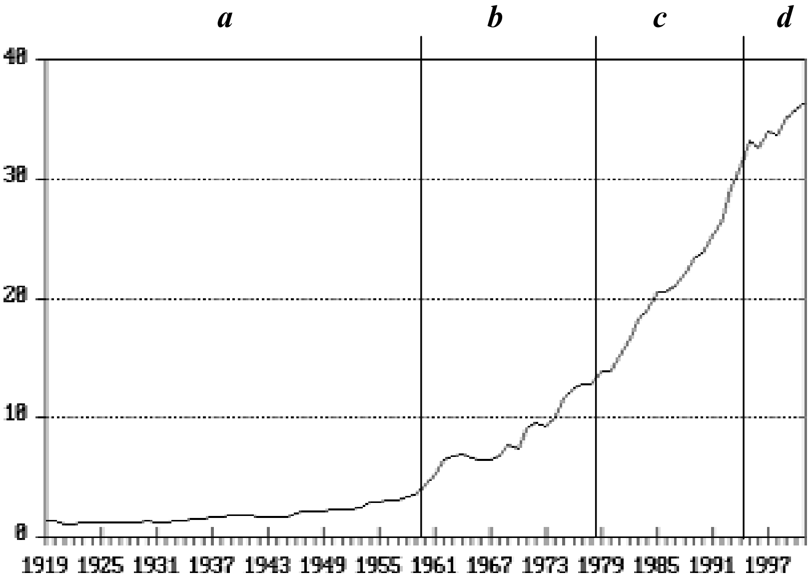

Figure 1. Average number of landrace ancestors per pedigree of winter wheat cultivars released in the former Czechoslovakia and the present Czech Republic

a – period I (1919–1959); ***b*** – period II (1960–1978); ***c*** – period III (1979–1994); ***d*** – period IV (1995–2001)

Carosella, Sicilian Squarehead, Daruma, Kenya Bf-4-3-B-10-V-1 and Red Egyptian), in 1984 of cultivar – Viginta (Sapporoharukomugi, Manchuria 142 and Beloturka) etc.

In the fourth period (1995–2001) the average number of ancestors per pedigree has increased further, from 33.28 to 36.52. The Shannon diversity index varied from 3.02 to 3.12. Nevertheless, the rate of diversity increase has been slowed down. During this period only 10 new landraces appeared in pedigrees of released cultivars.

The dynamics of changes of local Czechoslovak and foreign original ancestors (Figure 2) shows that during the first 40 years (1919–1959) a significant number of indigenous ancestors were lost, i.e. 45 original ancestors, among them 24 of Czechoslovak origin. In the next 40 years, 26 original ancestors were lost and four of them were of Czechoslovak origin. Altogether 28 Czechoslovak landrace ancestors were lost during the period 1919–2001, encompassing three quarters of all Czechoslovak original materials (Table 1). Many of these materials could have carried a complex of valuable genes (e.g. for adaptation to specific local conditions). Therefore, this process should be considered as a genetic erosion of indigenous genetic diversity. Nevertheless, the total number of original ancestors during the last 40 years has increased five times.

The 56 cultivars included in the Czech National List of Varieties 2000–2001 can be separated into

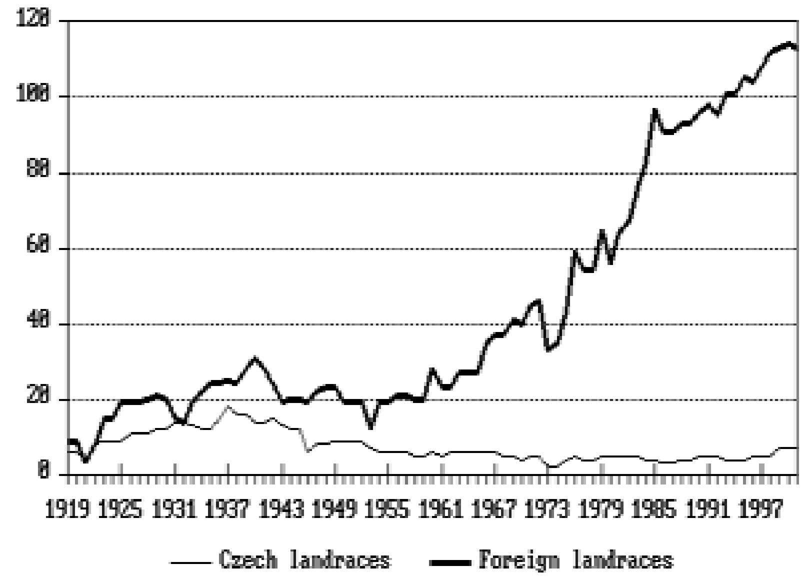

Figure 2. Number of landrace ancestors of winter wheat cultivars released in the former Czechoslovakia and the present Czech Republic during 1919–2001

Table 1. Original Czechoslovak and Czech ancestors lost during 1919 to 2001

Original ancestor	Period
1. Pšenice Regina	1919–1920
2. Česká žlutka	1922–1924
3. Jinonická přesívka	1923–1926
4. LV-Kovárce from Kovárecká biela 24	1925–1929
5. LV-CSK from Zapotilova bílá vouska	1930–1931
6. Krajová-Loděnice	1919–1932
7. Volha hnědoklasá	1929–1933
8. Krajová-Bes	1934–1937
9. Zora osinatá	1934–1937
10. Dobrovická přesívka	1935–1938
11. LV-Malonice from Lumbeho Malonicka zlatá	1931–1939
12. LV-Velkogrunov from Lumbeho Malonicka zlatá	1931–1939
13. Müllerova šumavská vouska	1936–1940
14. Jihomoravská hnědoklasá osinatka	1919–1941
15. LV-Hana from Novodvorská bělka	1939–1942
16. Krajová-Dolní Rakousko	1919–1942
17. Hanacká bělka krajová	1922–1943
18. Valtická krajová	1927–1945
19. LV-Západní Čechy from Olešenská přesívka	1936–1945
20. Krajová-Zemplínská Rusava	1942–1945
21. Slovenská krajová	1921–1952
22. Krajová-Chrudim	1937–1952
23. Slovenská červená	1930–1953
24. Jihomoravská holice	1932–1957
25. Hodonínská krajová jarka	1962–1969
26. LV-Pyšely from Česká přesívka	1919–1972
27. Jihomoravská osinatka	1930–1972
28. LV-Silesia from Frankensteiner	1975–1983

different clusters (Figure 3). The detected clusters cover 92.9% of the genetic diversity in modern winter wheat cultivars grown in the Czech Republic. Mean Renkonen similarity indexes within and between clusters are shown in a triangular matrix (Table 2). The within-cluster similarity indexes considerably exceed the relevant indexes between clusters; therefore, it is possible to consider the revealed cluster structure as statistically proved. In the given set of cultivars the Renkonens' similarity indexes for full-, half- and quarter-sibs are approximately equal to 0.72, 0.36 and 0.18, respectively.

Cluster A includes 22 (39.3%) cultivars incorporated at the level of similarity $P = 0.38$, that slightly

Table 2. Within- (diagonal) and between-cluster Renkonen similarity indexes for winter wheat cultivars included in the Czech National List of Varieties 2000–2001

Cluster		A	b1	b2	C
A		0.384	0.248	0.191	0.231
B	b1		0.383	0.279	0.143
	b2			0.485	0.119
C					0.486

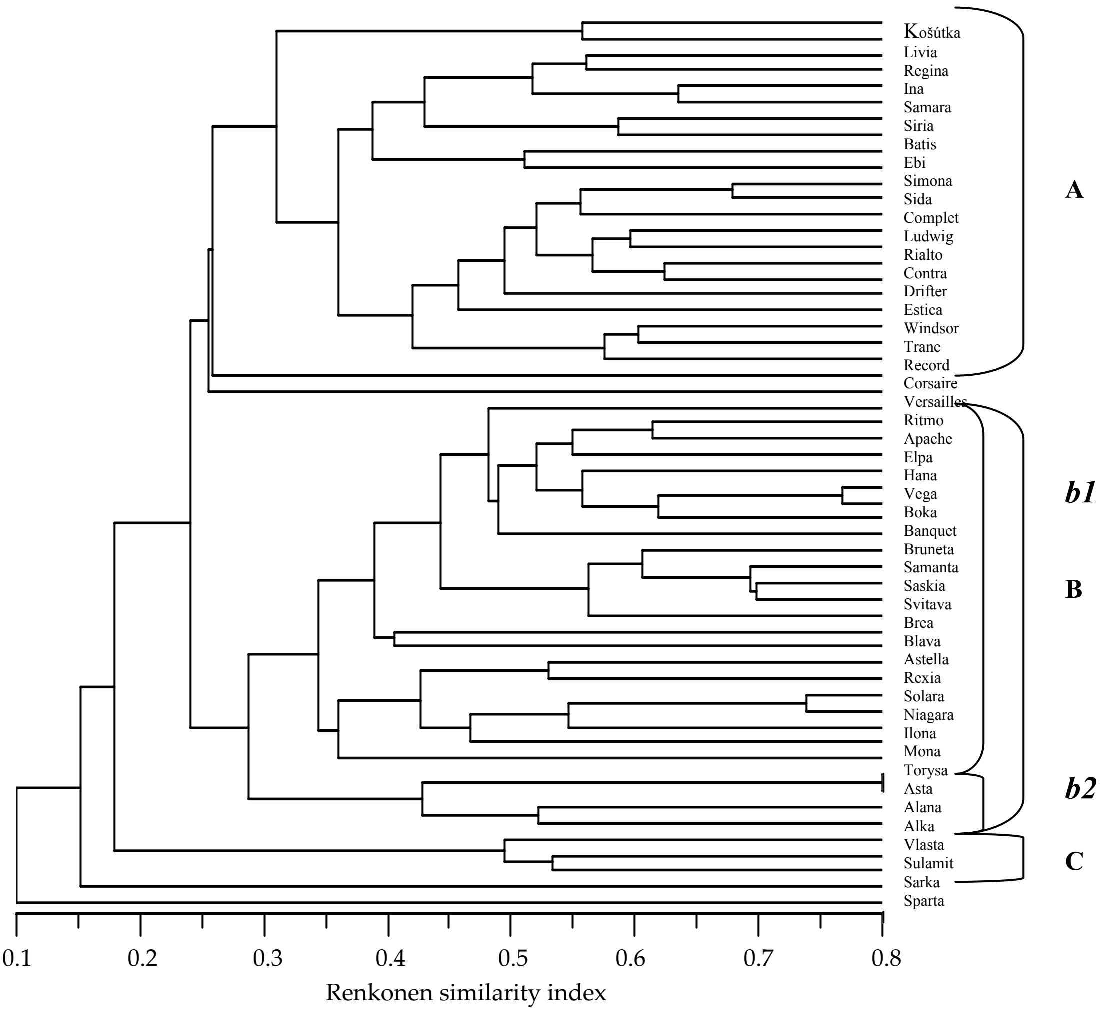

Figure 3. Cluster structure of the winter wheat cultivars included in the Czech National List of Varieties 2000–2001

exceeds the level of similarity for half-sibs. The majority of cultivars within this cluster originate from Western Europe and only eight from former Czechoslovakia and the present Czech Republic. All cultivars of cluster A are the descendants of Cappelle Desprez, Hybride du Joncquois, Vilmorin 27 (France), Professeur Delos, Professeur Marchall (Belgium), Heines VII (Germany), Maris Huntsman, Maris Hobbit (Great Britain) and other cultivars from Western Europe. There are 100 landrace ancestors in this cluster. The greatest contributions came from landraces Mediterranean (0.102), Ghirka Spring (0.052) and Ble Seigle (0.046).

Cluster B unites 27 (48.2%) cultivars incorporated at the similarity level for half-sibs ($P = 0.36$) which are the descendants of Mironovskaya 808 (Ukraine) and Bezostaya 1 (Russia). Altogether 108 original ancestors (landraces) created the gene pool of cluster B. The greatest contributions have been provided by Ukrainian landraces LV-Kremenchug (0.107) – through cultivar Mironovskaya 808, LV-Kiev (0.047) and Banatka (0.036) – through Bezostaya 4. Inside this cluster it is possible to allocate two sub-clusters, b1 and b2. The majority of cultivars (23) of this cluster belong to sub-cluster b1. The average contributions of Mironovskaya 808 and Bezostaya 1 in this sub-cluster are equal to 0.190 and 0.250, respectively. Sub-cluster b2 was formed by four cultivars; while the average contribution of Mironovskaya 808 is about equal to b1, the contribution of Bezostaya 1 in sub-cluster b2 is smaller (0.075). A maximal contribution (0.281) has been identified for the line Weihenstephaner 378.57.132b developed from a cross between *T. aestivum* L. and the triticale cv. Kattermann. All cultivars belonging to this cluster have been devel-

Appendix I. Description of the winter wheat cultivars registered in the former Czechoslovakia and the present Czech Republic in particular years

Year	Number of cultivars	Total number of original ancestors	Average number of original ancestor per pedigree	Number of Czechoslovak ancestors	Number of foreign ancestors	Number of lost original ancestors	New original ancestors added	Shannon diversity index
1919	33	15	1.30	6	9	–	–	1.83
1920	34	15	1.29	6	9	–	–	1.81
1921	17	7	1.06	4	3	3	5	1.41
1922	49	16	1.10	8	8	–	3	2.04
1923	65	24	1.12	9	15	–	8	2.11
1924	70	24	1.13	9	15	–	–	2.09
1925	71	28	1.18	9	19	1	5	2.15
1926	64	30	1.23	11	19	–	1	2.27
1927	66	30	1.23	11	19	1	3	2.26
1928	72	31	1.22	11	20	–	1	2.30
1929	67	33	1.22	12	21	–	2	2.42
1930	65	32	1.26	12	20	2	3	2.43
1931	64	29	1.21	14	15	–	2	2.40
1932	58	28	1.21	14	14	1	1	2.34
1933	63	32	1.37	13	19	2	3	2.37
1934	67	34	1.40	12	22	1	3	2.44
1935	71	36	1.51	12	24	1	4	2.44
1936	76	39	1.54	15	24	1	2	2.58
1937	80	43	1.58	18	25	–	4	2.65
1938	78	40	1.67	16	24	3	1	2.55
1939	78	44	1.73	16	28	1	2	2.59
1940	79	45	1.78	14	31	2	3	2.59
1941	64	42	1.83	14	28	2	-	2.56
1942	51	39	1.71	15	24	4	1	2.56
1943	37	32	1.65	13	19	2	–	2.48
1944	36	32	1.58	12	20	1	1	2.50
1945	35	32	1.66	12	20	–	–	2.50
1946	31	25	1.90	6	19	5	–	2.24
1947	38	30	2.05	8	22	1	–	2.40
1948	39	31	2.15	8	23	–	1	2.43
1949	40	32	2.18	9	23	–	–	2.47
1950	29	28	2.21	9	19	3	–	2.50
1951	28	28	2.32	9	19	–	–	2.48
1952	28	28	2.32	9	19	–	–	2.48
1953	20	19	2.45	7	12	6	–	2.21
1954	20	25	2.95	6	19	1	2	2.25
1955	20	25	2.95	6	19	–	–	2.25
1956	22	27	3.09	6	21	–	1	2.46
1957	22	27	3.09	6	21	–	–	2.46
1958	19	25	3.32	5	20	1	–	2.44

Apendix 1 to be continued

Year	Number of cultivars	Total number of original ancestors	Average number of original ancestor per pedigree	Number of Czechoslovak ancestors	Number of foreign ancestors	Number of lost original ancestors	New original ancestors added	Shannon diversity index
1959	18	25	3.45	5	20	–	–	2.49
1960	17	34	4.30	6	28	–	7	2.71
1961	11	28	5.27	5	23	3	–	2.57
1962	9	29	6.44	6	23	–	1	2.64
1963	10	33	6.70	6	27	–	3	2.75
1964	10	33	6.90	6	27	–	–	2.74
1965	11	33	6.64	6	27	–	–	2.68
1966	13	41	6.38	6	35	–	8	2.71
1967	15	43	6.47	6	37	–	2	2.79
1968	14	42	6.71	5	37	–	–	2.75
1969	15	46	7.67	5	41	–	4	2.79
1970	11	44	7.45	4	40	1	–	2.70
1971	13	50	9.15	5	45	–	5	2.86
1972	14	51	9.57	5	46	–	–	2.81
1973	7	35	9.29	2	33	3	–	2.43
1974	7	37	10.00	2	35	3	–	2.48
1975	10	47	11.50	4	43	–	8	2.58
1976	14	64	12.43	5	59	–	12	2.73
1977	10	58	12.80	4	54	3	–	2.73
1978	10	58	12.80	4	54	–	–	2.73
1979	16	70	13.94	5	65	–	8	2.66
1980	15	61	13.87	5	56	–	–	2.34
1981	18	69	15.06	5	64	–	7	2.49
1982	18	72	16.44	5	67	–	1	2.49
1983	19	81	18.26	5	76	–	12	2.70
1984	22	87	19.05	4	83	3	7	2.69
1985	25	101	20.48	4	97	–	11	2.76
1986	20	94	20.55	3	91	2	–	2.68
1987	18	94	21.00	3	91	–	–	2.71
1990	19	101	23.84	5	96	–	1	2.94
1991	21	103	25.38	5	98	–	1	2.99
1992	22	100	26.40	5	95	1	1	1.97
1993	22	105	29.23	4	101	1	1	3.03
1994	23	105	31.13	4	101	5	4	3.07
1995	29	109	33.28	4	105	1	–	3.04
1996	34	109	32.68	5	104	–	–	3.05
1997	35	113	34.08	5	108	–	2	3.02
1998	40	117	33.70	5	112	–	2	3.07
1999	48	120	35.12	7	113	–	5	3.11
2000	52	121	35.81	7	114	–	1	3.13
2001	52	120	36.00	7	113	–	–	3.12

Appendix II. List of original ancestors found in pedigrees of more than 20 winter wheat cultivars released in the former Czechoslovakia and the present Czech Republic from 1919 to 2001

Original ancestor name	Country	NC*	Years**
Akakomugi	JPN	66	1966–2001
Banatka	HUN	21	1919–1976, 1985–2001
Banatka (UKR)	UKR	53	1966–2001
Barleta	ARG	54	1966–2001
Blé de Pays Americain	USA	53	1919–1957, 1963–2001
Blé Seigle	FRA	74	1927–2001
Carosella	ITA	34	1983–2001
Chinese 165	CHN	22	1981–2001
Chinese Spring	CHN	39	1981–2001
Crimean	UKR	87	1923–1930, 1939–1945, 1956–2001
Daruma	JPN/KOR	31	1983–2001
Dickkopf	DEU	44	1940–2001
Etawah	IND	33	1983–2001
Gehun	IND	35	1960–2001
Ghirka Spring	RUS	65	1975–2001
Hard Red Calcutta	IND	62	1919–1920, 1935–2001
Heines 110	DEU	22	1992–2001
Hohenheimer 77	DEU	22	1979–2001
Indian G	IND	37	1983–2001
Introduction from GBR	GBR	56	1975–2001
Iumillo	ITA	21	1981–2001
Krajová-Vrbové	CSK	36	1919–1967, 1976–2001
Ladoga	RUS	35	1960–2001
LV-ENG from Prince Albert	GBR	54	1975–2001
LV-Maerkischer from Kladener Altmaerkischer Braunweizen	DEU	30	1963–2001
LV-Odessa from Noe	UKR	80	1927–2001
LV-Odessa from Odessa	UKR	41	1956–2001
LV-Pyšely from Česká přesívka	CSK	48	1919–1972
LV-Russian from Carstens VIII	RUS	22	1983–2001
LV-Sahara from El Krelof	DZA	50	1960–1969, 1975–2001
LV-Scania from Pansar	SWE	41	1954–2001
LV-Seignora from Blaue Dame	FRA	29	1960–2001
LV-Seignora from Gruene Dame	FRA	29	1960–2001
LV-Skane from Sol I	SWE	47	1954–2001
LV-Skania from Kotte	SWE	31	1923–1926, 1933–1949, 1960–2001
LV-Tiszavideki from Bankuti 5	HUN	12	1935–1973
LV-UKR from Lutescens 17	UKR	52	1966–2001
LV-UKR Kremenchug from Artemovka	UKR	47	1966–2001
LV-URY from Klein Universal-II	URY	54	1966–2001
Mediterranean	Europa	130	1919–2001
Modrows Preussen	DEU	30	1963–2001
Onega	RUS	26	1960–1972, 1979–2001
Ostka Galicyjska	POL	89	1919–1920, 1935–2001
Petkus	DEU	23	1935–1940, 1972–2001
Redchaff	USA	44	1979–2001
Red Straw	GBR	49	1976–2001
Rieti	ITA	88	1966–2001
Saumur de Mars	FRA	30	1960–1972, 1982–2001
Schonen	SWE	33	1971–2001
Squarehead type from Norfolk	GBR	53	1975–2001
T. timopheevii	?USA	39	1981–2001
Uckermaerkischer Dummel	DEU	62	1940–2001
Yaroslav Emmer	RUS	30	1976–2001
Zeeuwse	NLD	67	1966–2001

*number of cultivars with a related ancestor in their pedigree; **period during which cultivars with a related ancestor in their pedigree were registered oped in Czechoslovakia or in the Czech Republic. The cluster B is rather close to cluster A because the average similarity index between cultivars in these clusters is estimated by $P = 0.24$, which approximately corresponds to an average between half- and quarter-sibs. This can be explained by the use of genetically rather similar breeding materials created in West European countries.

Another small cluster (C) contains the three Dutch cvs Semper, Sepstra and Tower. All three are derivatives of cv. Obelisk, about whose origin is only known that it came from a composite cross of 36 cultivars. Once complete information on these cultivars becomes available it is possible that they would join one of the clusters described above.

Four (7.1%) cultivars (Apache, Athlet, Elpa and Vlada) could not be included in clusters A, B and C. For the first three cultivars the information about pedigrees was incomplete, i.e. the origin of one of the parents of these cultivars is not known. The cultivar Vlada, like cultivars from cluster B, is a derivative of Mironovskaya 808 and Bezostaya 1 (via Kavkaz). However, there are no original ancestors of West-European cultivars in its pedigree and, therefore, cultivar Vlada does fit into cluster B.

The average similarity index for the cultivars of the Czech National List of Varieties 2000–2001 is equal to $P = 0.279$. This corresponds to an average between half- and quarter-sibs. Usually a similarity on the level of half-sibs can be considered as being critical. A higher similarity may result in dangerous consequences due to poorly diversified resistance to stresses. Hence, it can be concluded that the diversity of winter wheat cultivars grown now in the Czech Republic is at a safe level.

The study of dynamics of changes in genetic diversity over time showed that from 1930 to 1970 many Czechoslovak original ancestors disappeared from the pedigrees of cultivars, indicating that genetic erosion within the released genetic diversity had occurred during that period. However, some landraces of local origin are still present in pedigrees of modern cultivars. Examples are Branišovická III 55, Hodonínská jarní, Lučenec-Krajová, Postoloprty-Krajová, Vrbové-Krajová and LV-Moravia from Hodonínská. These landraces were well-known at the beginning of the last century and, together with other materials, they constituted a base for wheat breeding in the regions of their origin (Bareš & Dotlačil 1990). The landrace from the Vrbové region (Vrbové-Krajová) remains the most frequent ancestor (in 36 pedigrees of cultivars registered in 2001) within this group.

In the last period, an increasing level of diversity in winter wheat cultivars through wider use of foreign materials can be noticed. Especially cultivars from Germany (Alcedo, Alidos, Carstens VIII, Diplomat, Fakir, Caribo, Weihenstephaner 378.57.132b, Carstens VIII), France (Artois Desprez, Cappelle Desprez, Hybride du Joncquois, Etoile de Choisy, Nord Desprez, Moisson), Great Britain (Brimstone, Maris Huntsman, M. Marksman, M. Brigand, M. Fundin, Mercia), Netherlands (Arminda, Tadorna) and other countries of Central and Western Europe, the former USSR (Mironovskaya 808, Bezostaya 1, Kavkaz, Aurora, Mironovskaya Jubilejnaya, Ilichevka) were used in breeding programs. Many cultivars mentioned above are donors of genes reducing plant height (*Rht1*, *Rht2*, *Rht1S* and/or *Rht8*, *Rht11*) and/or of genes for resistance to fungal diseases.

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Abstrakt

Stehno Z., Dotlačil L., Faberová I., Martynov S., Dobrotvorskaya T. (2003): **Genealogická analýza genetické diversity odrůd ozimé pšenice pěstovaných na území bývalého Československa a nynější České republiky v období 1919–2001**. Czech J. Genet. Plant Breed., **39**: 99–108.

S použitím genealogické analýzy byla studována genetická rozmanitost odrůd pšenice ozimé pěstovaných na území bývalého Československa a dnešní České republiky v období let 1919 až 2001. Výrazný nárůst genetické diversity odrůd od sedmdesátých let byl podmíněn širokým využíváním zahraničních materiálů ve šlechtitelských programech pocházejících zejména ze států střední, západní a východní Evropy. Souběžně bylo možné u povolených sortimentů odrůd prokázat genetickou erozi. V období od třicátých let do let sedmdesátých se převážná část původních místních předků z rodokmenů pěstovaných odrůd vytratila. Soubor odrůd ozimé pšenice zapsaných ve Státní odrůdové knize ČR pro období 2000–2001 je možné rozlišit do shluků. Výraznou většinu odrůd lze zařadit do dvou shluků, které jsou svým rozsahem dosti podobné. Do prvého shluku se řadí odrůdy s předky ze západní Evropy a ve druhém shluku převládají odrůdy s převahou předků z východní Evropy, vnesených především prostřednictvím odrůd Mironovskaja 808 a Bezostaja 1. Střední index podobnosti mezi moderními odrůdami pěstovanými v České republice odpovídá průměru mezi polovinou až čtvrtinou hodnot sourozenců (sib). Lze tedy usoudit, že genetická rozmanitost ozimých odrůd pšenice v současné době pěstovaných v České republice se v posledních desetiletích zvýšila a může být považována za dostačující.

Klíčová slova: pšenice ozimá; genetické profily; původní předci; genetická eroze; shluková analýza

Corresponding author:

Ing. Zdeněk Stehno, CSc., Výzkumný ústav rostlinné výroby, odbor genetiky a šlechtění, 161 06 Praha 6-Ruzyně, Česká republika
tel.: + 420 233 022 364, fax: + 420 233 022 286, e-mail: stehno@vurv.cz