

OLD APPLE CULTIVARS IN THE BOTANICAL GARDEN-CENTER FOR BIOLOGICAL DIVERSITY CONSERVATION OF THE POLISH ACADEMY OF SCIENCES

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SUMMARY

In the Botanical Garden-Center for Biological Diversity Conservation in Warsaw a collection of old historical apple cultivars was established. The main goal is to gather and evaluate in *ex situ* conditions a possibly large number of apple cultivars which were known in Poland in the past.

Since 1987 over 500 accessions have been gathered (195 come from scientific institutions in Poland and abroad, the rest from private orchards in Poland). Trees of 248 accessions grow in the collection as a typical orchard and young material remains in nursery. Every year local expeditions are organized and new accessions are brought to the Botanical Garden as grafts. All accessions are accompanied by passport data. Phenological observations such as start of vegetation period, time of blooming and ripening, degree of damage by scab and mildew are made every year. Fruits are described according to UPOV guidelines. Fruits of 178 cultivars in collection and 40 in nursery have been described.

Gathering of old apple cultivars and their maintenance in *ex situ* collection and evaluation are very important for our national heritage conservation. There is a necessity to protect old apple cultivars *on farm* conditions as well.

INTRODUCTION

In Poland at the turn of the nineteenth century apple trees grew almost near every cottage. A range of cultivars was large from ripening in early summer to late winter and from dessert to culinary. Trees grew big and strong, gave shadow and provided a shield against winds and natural site for numerous organisms. They were inseparable part of country landscape.

In recent decades of the XX century a range of apple cultivars commercially available has changed and evidently decreased from over 150 to 40. Many of good apple cultivars which were common in Poland before the 2nd World War have disappeared. In modern orchards new cultivars are planted and cultivated by new modern techniques. They have good economic qualities, bear fruits every year but are similar in respect of some features. Trees are small, short living and demand intensive raising.

According to resolutions of Biological Biodiversity Convention (1992) in the whole world numerous programs of plant protection are managed, fruit trees varieties including.

In Botanical Garden-Center for Biological Diversity Conservation of the Polish Academy of Sciences a collection of old apple cultivars was established. Our goal is to gather and evaluate in *ex situ* conditions a possibly large number of apple cultivars which were known in Poland in the past.

MATERIALS AND METHODS

Material there are 385 apple trees of 248 old cultivars gathered in collection and 377 (mostly younger) trees of additional 300 accessions in nursery. Trees in collection are planted as a traditional orchard in six rows in spacing 4,5 x 3,5 m.

Collecting started in 1987. Every year local expeditions or visits to scientific institutions are organized and new accessions are brought to the Botanical Garden as grafts. Grafts are grafted onto rootstocks in nursery. At first traditional vigorous rootstocks were used ('Antonovka' seedling) but now because of shortage of ground semi-dwarf rootstocks such as M26 and M7 are used.

All accessions are accompanied by passport data which include: origin (if known), source

and date of bringing, sort of rootstock, date of grafting, date of planting to collection and date of first fruiting.

Since 1994 phenological observations such as start of vegetation period, time of blooming and ripening have been made every year and fruits are described according to UPOV guidelines (24 characteristics were chosen). Since 2002 degree of damage by two diseases: scab (*Venturia inaequalis* (Cke.) Aderh.) and mildew (*Podosphaera leucotricha* (Ellis et Everh.) Salm) has been estimated. Documentation in electronic format is kept. If gathered accessions are unknown or bear local names they undergo identification.

RESULTS AND DISCUSSION

Since 1987 over 500 accessions of old apple cultivars have been gathered, among them 'Kosztela', 'Złota Reneta', 'Ananas Berżenicki' and 'Malinówka' which were very popular in the past. Part of collected material (195 accessions) comes from scientific institutions: 85 from Institute for Fruit Growing and Floriculture Skierniewice, 21 from Research Institute for Fruit Growing and Ornamentals Újfehértó (Hungary), 16 from Byelorussian Research Institute for Fruit Growing, 15 from University of Agriculture in Lublin, 14 from University of Agriculture in Warsaw, 10 from Fruit Genebank Dresden-Pillnitz (Germany), 10 from Central Botanical Garden of the Byelorussian Academy of Sciences, 9 from Ethnographical Museum Rožnov (Czech Republic), 8 from National Botanical Garden in Kiev (Ukraine), 7 from Station for Protection of Animals Bartošovice (Czech Republic).

A great number of old apple cultivars (over 300) comes from old private orchards from the territory of Poland. A schematic map shows years and places of local expeditions which have been undertaken since 1990 (Fig. 1). Provinces of Mazowieckie, Kujawsko-Pomorskie, Podlaskie, Małopolskie and Podkarpackie were visited 6 times, provinces of Warmińsko-Mazurskie and Lubelskie 3 times. Provinces of Zachodniopomorskie and Pomorskie were visited in 1997 and 1998, Lubuskie in 2000 and Lower Silesia was visited 2 times in 2002 and 2003.

A large number of accessions brought from local expeditions demand identification. Orchard's owners often do not know cultivars' names because the trees were planted by their ancestors or previous inhabitants like in the case of territory of west Poland. Some cultivars bear local names: 'Buraczki', 'Pisaki', 'Dziadki', 'Kogutki', 'Kusaki', 'Gruchoty', 'Kapuśniaki' and 'Talerzyki'. Some of them are already identified.

In collection apple trees start vegetation period at the end of March on average. The earliest are 'Kandil Sinap' and 'Reneta Kurska', the latest 'Krótkonózka Królewska' ('Royal Courtpendu') and 'Mank's Küchenapfel'. Trees blossom in the first half of May, first are 'Spasowka' and 'Red Astrachan', last 'Spätblühender Taffetapfel' and 'Minister von Hammerstein'.

So far fruits of 178 cultivars in collection and 40 in nursery have been described. Trees reach fructifying period according to sort of rootstock after 2–8 years from grafting. The trees of majority of old cultivars fructify alternately (biennial bearing). Because of limited level of chemical protection against pests and diseases crop of fruits in collection oscillates from small to mean.

There are seasons when some pests and diseases cause damage unabbling apples' description, e.g. brown rot (*Monilinia fructigena* (Aderh. et Ruhl.) Honey), apple blossom weevil (*Anthonomus pomorum* L.) and aphid (*Dysaphis plantaginea* Pass.).

In collection apples ripen from the end of July – 'Virgin Aranka', 'Oliwka Inflancka' ('Yellow Transparent') till January – 'Calville de Saint Sauver', 'Boiken', 'Grochówka' ('Grosse Bohnapfel'). Fruits of 'Champagne Reinette' can be stored till August next year in a common cellar.

Damage by scab and mildew in 2002 and 2003 seasons was small because of warm and dry weather. Spring 2004 was chilly and rainy so many trees had serious scab symptoms. 10 cultivars were chosen which were supposed to be the most tolerant of scab and mildew: 'Antonovka Obyknoviennaja', 'Bramley's Seedling', 'Early Victoria', 'Doneszta', 'Lane's Prince Albert', 'Rozmaryn Russkij', 'Soländer Streifling', 'Spätblühender Tafetapfel', form 13/96 from village Optyń (Podkarpackie



Fig. 1. Years and places of local expeditions which were undertaken from 1990 in Poland.

province) and form 11/97 from village Kamionek Wielki (Pomorskie province). The last two forms are not identified.

Gathering of old apple cultivars, their maintenance *ex situ* and evaluation is very important for our national heritage conservation. There is a necessity to protect them on farm conditions as well.

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List of old apple cultivars gathered in the Botanical Garden of the Polish Academy of Sciences in Warsaw (accessions numbered (without names) are not included).

1. Abondanza
2. Adam Mickiewicz
3. Adam's Pearmain
4. Adersleber Kalvill
5. Ajzerowska (local name)
6. Akata
7. Akerö
8. Alpiniszt
9. Amália
10. Ananas Berżeński
11. Anis
12. Anis Połosatyj
13. Anoka
14. Antonówka Diesertnaja
15. Antonówka Kamienna
16. Antonówka Kołowa
17. Antonówka Mohylewska
18. Antonówka Półtorafuntowa (Śmietankowa)

19. Antonówka Stakanczataja
20. Antonówka Obyknaviennaja
21. Aporta
22. Arkad Zimowy
23. Arkad Żółty
24. Babuszkino
25. Bankroft
26. Barnack Beauty
27. Beforest
28. Bellfleur Kitajka
29. Ben Davis
30. Beregi Sívári
31. Berlepsch
32. Berlepsch Rotherapfel
33. Berner Rosen
34. Bezsiemianka
35. Białe Litewskie
36. Bielasy (local name)
37. Bischofshut
38. Bismarckapfel
39. Blahova Rožena Reneta
40. Bochowskie
41. Bogatyr
42. Boiken
43. Braeburn
44. Bramley's Seedling
45. Brzaskwiniowe (Pfirsichroter Sommerapfel)
46. Bukówka Biała
47. Burgundy
48. Bursztówka Polska
49. Ceglédi piros Simonffy
50. Cellini
51. Cesarz Wilhelm (Kaiser Wilhelm)
52. Charles Rosse
53. Chałamowskie (Borovinka)
54. Chodské
55. Cox's Pomona
56. Cukrówka
57. Cygany (local name)
58. Cynamonówka Ananasowa (Koricznoje Ananasnoje)
59. Cynamonówka Prążkowana (Koricznoje Połosatoje)
60. Cytrynowe Zimowe
61. Cytrynówka (Zitronenapfel)
62. Czarnodrzewne
63. Czarnoguz
64. Czarny Byk
65. Czerwona from Przybroda
66. Czerwonka (local name)
67. Czubatka (local name)
68. Deserowe (local name)
69. Dobry Kmiotek (Dobryj Krestianin)
70. Doneszta
71. Duke of Klarens
72. Dvorčinka
73. Dziadek (local name)
74. Early Crimson
75. Early Victoria
76. Edelrother
77. Ellisona Pomarańczowa (Ellison's Orange)
78. Entz Rozmaring
79. Fameuse
80. Fantas alma Bicske
81. Fekete tányér alma
82. Filipa
83. Gaskońskie Szkarłatne (Gascoyn's Scarlet)
84. Glockenapfel
85. Glogierówka (Littauischer Pepping)
86. Gloria Mundi
87. Golden Noble
88. Gołębek Nowoangielski (Taubenapfel)
89. Graftsynek Czerwony (Grawensteiner Roter)
90. Graftsynek Inflancki (Rosenstreifling)
91. Grahama Jubileuszowe (Graham's Jubiläumsapfel)
92. Granny Smith
93. Grochówka (Grosser Bohnapfel)
94. Grochówka Królewska
95. Gruchoty (local name)
96. Gruszowka Moskowskaja
97. Gruszowka Rewelska
98. Gubener Warraschke
99. Gustawa Trwałe (Gustaws Dauerapfel)
100. Gyllenkrok
101. Hiberna
102. Ingrid Marie
103. Jachontowaja
104. Jacob alma Ráckeve
105. Jadernička Moravská
106. Jakob Lebel
107. Jakubinka (local name)
108. Jantarnoje
109. Jonathan
110. Jugenapfel
111. Kalterer Böhmer
112. Kalville de Saint Sauver
113. Kalwila Badeńska (Grossherzog von Baden)
114. Kalwila Czerwona Jesienna (Calville Rouge d'Automne)
115. Kalwila Czerwona Zimowa (Calville Rouge d'Hiver)

116. Kalwilla Śnieżna Biała
117. Kalwilla Letnia Fraasa (Fraas' Sommer Kalvill)
118. Kalwin
119. Kalwinka
120. Kalwinka Ukraińska
121. Kanadyjskie Czerwone
122. Kandil Synap
123. Kantówka Gdańska (Danzinger Kantapfel)
124. Kapuśniak (local name)
125. Kardynalskie (Geflamter Weisser Kardinal)
126. Karin Schneider
127. Kazachstanskoje Jubilejnoje
128. Kecskeméti var. alma
129. Kent
130. King David
131. Kitajka Anisowaja
132. Kogutki (local name)
133. Koksa Pomarańczowa (Cox's Orange Pippin)
134. Korobowka
135. Korona Napoleońska
136. Kosztela
137. Kożene
138. Kralické
139. Krasa Reneta (local name)
140. Krągi (local name)
141. Krepla
142. Kronselska (Transparent de Crosels)
143. Królowa Renet (Winter Goldparmäne)
144. Krótkonóżka Królewska (Court Pendu Rouge)
145. Książę Albrecht Pruski (Prinz Albrecht von Preussen)
146. Książęca (Prinzenapfel)
147. Księżna Luiza (Prinzessin Louise)
148. Kusaki (local name)
149. Kuzynek
150. Landsberska (Landsberger Renett)
151. Landsberska Szara from Dąbrowice
152. Lane's Prince Albert
153. Laxton's Superb
154. Lord Lambourne
155. Lord Suffield
156. Major
157. Malinowa Oberlandzka (Oberländer Himbeerapfel)
158. Malinowe Nowe
159. Mank's Küchenapfel
160. Marie Pinel de la Toule
161. Martini
162. Maśniok (local name)
163. Medůvka
164. Merton Spy
165. Minister von Hammerstein
166. Mišenské
167. Mnich
168. Mohringer Rosenapfel
169. Muchrik
170. Muskat Renette
171. Naliv Rosovyj
172. Napoleon (Cosenza Gentile)
173. Nathusius Taubenapfel
174. Neujahrsapfel
175. Northen Spy
176. Syberyjka (local name)
177. Nyári selymes
178. Odinkowskoje Biełoje
179. Ohm Paul
180. Oliwka Czerwona (Astrachanskoje Krasnoje)
181. Oliwka Żółta (Yellow Transparent)
182. Ontario
183. Oranie
184. Oretorpsereinette
185. Orzechówka
186. Owcze Nosy
187. Panenské České
188. Panienka
189. Papierówka Słodka
190. Papirovkja Jantarnaja
191. Parówki (local name)
192. Patten 396
193. Peasgood's Nonsuch
194. Pederstrup
195. Peggy's Favourite
196. Peppin Kitajka
197. Pepina Angielska
198. Pepina Linneusza (Gelber Bellefleur)
199. Pepina Ribstona (Ribston Pippin)
200. Pepina Szafranowa
201. Perkins
202. Perła
203. Piękna Ołtarzewska
204. Piękna z Herrnhut (Schöner aus Herrnhut)
205. Piękna z Rept
206. Pisaki (local name)
207. Polskie Mnichy
208. Poziomka
209. Priewoschodnoje (Stark)
210. Prof. Jankowski
211. Putiwka Osiennaja
212. Queen

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| 213. Rajewskie | 263. Suislepskie |
| 214. Rajok | 264. Suislepskie Czerwone |
| 215. Rambour Stichy (Rapa Czerwona) | 265. Sybirak (local name) |
| 216. Rapa Zielona | 266. Synap Alma – atinskij |
| 217. Raritan | 267. Synap Sieviernyj |
| 218. Rarytas Ślaski | 268. Szafran Kitajka |
| 219. Rederka | 269. Szafranka |
| 220. Renet Bergamotnyj | 270. Szampańska |
| 221. Renet Sacharnyj od Miczurina | 271. Szándor Car |
| 222. Reneta Baumana | 272. Szara Reneta |
| 223. Reneta Blenheimska (Blenheim Orange) | 273. Szara z Zabergäu |
| 224. Reneta Czarniecka | 274. Szász pap alma |
| 225. Reneta Fromma | 275. Szklanki I |
| 226. Reneta Harberta | 276. Szklanki II |
| 227. Reneta Kanadyjska (Reinette de Canada) | 277. Sztetyna Czerwona (Roter Winterstettiner) |
| 228. Reneta Kaselska (Kasseler Reinette) | 278. Sztetyna Zielona (Grüner Winterstettiner) |
| 229. Reneta Królewska | 279. Śmietankowe (Samogitischer Schmandapfel) |
| 230. Reneta Kulona (Reinette Coulon) | 280. Taftianoje Pozdnocwietnoje (Spätblühender Taffetapfel) |
| 231. Reneta Kurska | 281. Talerzyk (local name) |
| 232. Reneta Litewska | 282. Titówka (Tulskie) |
| 233. Reneta Poznańska | 283. Truskawkowe Nietschnera |
| 234. Reneta Sudecka | 284. Truskawkowe Wilknorsa |
| 235. Reneta Szampańska (Reinette de Champagne) | 285. Tvarůžek Ojinene |
| 236. Reneta Szara Francuska (Graue französische Reinette) | 286. Tyrolka |
| 237. Reneta Weidnera | 287. Tyrolka Szlachetna |
| 238. Reneta Woskowa | 288. Veršavske Ružove |
| 239. Rojka | 289. Virigin Aranka |
| 240. Rojskie | 290. Vlasatice |
| 241. Rozmaryn Russkij | 291. Wagener |
| 242. Rózsasinii cousinot | 292. Wajland (local name) |
| 243. Różanka | 293. Waldsteppenapfel |
| 244. Rubin | 294. Wanatka |
| 245. Rulikowszky Kázmér | 295. Wargul Woroneżski |
| 246. Rumianka Alma-atinskaja | 296. Wierzbówka |
| 247. Ryszard Żółty (Gelber Richard) | 297. Winnik |
| 248. Rzepka | 298. Winogradka |
| 249. Sałtanat | 299. Winter Banana |
| 250. Séchenyj renet | 300. Wołoszka |
| 251. Sierpniówka (local name) | 301. Worcester Pearmain |
| 252. Signe Tillisch | 302. York Imperial |
| 253. Simirienko (Zielonka Wooda) | 303. Zailijskoje |
| 254. Sitówka (local name) | 304. Zajączek |
| 255. Skirianka | 305. Zánkai nyári alma |
| 256. Smalcówka (local name) | 306. Złotogłówka (Goldzeugapfel) |
| 257. Smiřické Vzácné | 307. Zorza (Zaria) |
| 258. Smuřivka | 308. Żeleźniak (Eiserapfel) |
| 259. Sohländer Streiflig | |
| 260. Spasówka | |
| 261. Stoksikówka (local name) | |
| 262. Strumiłówka | |