

COLLECTION OF THE GENUS *Malus* MILL. IN THE BOTANICAL GARDEN OF THE POLISH ACADEMY OF SCIENCES IN WARSAW

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A B S T R A C T

The Botanical Garden – Center for Biological Diversity Conservation in Warsaw has assembled a collection of the genus *Malus* Mill. Since 1987, about 700 accessions have been collected, including about 550 old cultivars which were cultivated before the Second World War. These old cultivars came from scientific institutions and private orchards from all over Poland and from the neighboring countries as well. Twenty common at present cultivars have been included in an exhibit of fruit trees and shrubs recommended for small gardens. Another part of collection contains 150 wild and ornamental apple genotypes, including 98 seedlings of *Malus sieversii* (Ledeb.) M. Roem from natural biotopes in the Tian-Shan mountains.

Since 1995, the varieties in the collection have been evaluated in terms of their growth, blossoming and fruit bearing seasons. Fruits have been described according to UPOV guidelines. Since 2002, damage due to apple scab and powdery mildew has been recorded. Passport data have been compiled for each accession. So far, 218 old local cultivars and 100 wild and ornamental genotypes have been described. Other cultivars and genotypes still await classification. Ten cultivars and 21 wild species have been identified as being especially tolerant to apple scab and powdery mildew.

Key words: *Malus* species, old apple cultivars, collection, description, scab tolerance

INTRODUCTION

One of the main tasks of a botanical garden is to gather, evaluate and present interesting new plant varieties. The Botanical Garden - Center for Biological Diversity Conservation of the Polish Academy of Sciences in Warsaw has assembled numerous collections of protected and endangered indigenous flora, temperate trees and shrubs, tropical and subtropical plants,

vegetables, fruit, medicinal, spice and ornamentals plants. Over the past twenty years, the Botanical Garden has assembled the collection of species and varieties of different fruit-bearing genera from all over the world, including *Malus*, *Pyrus*, *Amelanchier*, *Crataegus*, *Corylus* and *Prunus*.

The fruit which has been most often cultivated in Poland is the apple. The Botanical Garden has assembled a collection of the genus *Malus* Mill which includes wild and ornamental varieties and old cultivars which were cultivated before the Second World War. Many of these old cultivars can be recommended for small gardens. The Botanical Garden organizes lectures, shows and excursions in order to educate the public about the plants.

MATERIAL AND METHODS

Collecting of *Malus* species and cultivars into the Botanical Garden started in 1987. Since then, about 700 accessions have been collected, including about 550 old cultivars which were cultivated before the Second World War. 195 of these old cultivars come from scientific institutions from Poland as well as from the neighboring countries. Another 300 come from private orchards from all over Poland (Brzeziński, 1929; Jankowski, 1922; Rejman, 1994; Sękowski, 1993). The second part of *Malus* collection there is an exhibit of twenty common cultivars recommended for small gardens. Another part (out of exhibit) contains 150 wild and ornamental apple genotypes, including 98 seedlings of *Malus sieversii* (Ledeb.) M. Roem from natural biotopes in the Tian-Shan mountains.

Since 1990, the Garden has organized local expeditions every year. Since 1995, these expeditions and the maintenance of the collected trees have been financed in part by the Ministry of Agriculture and Rural Development.

Apple species (in majority) come from the Arboretum in Rogów, Poland, the Arboretum in Kórnik, Poland, and the Institute for Fruit Growing in Dresden-Pillnitz, Germany (Bugala and Straus, 1980; Krüssmann, 1977).

Cultivars and species under evaluation are grafted on 'Antonovka' seedling and M.7 rootstock and planted 3.5 x 4.5 meters apart. The collection contains two trees of each accession. Trees of *Malus sieversii* are seedlings from seeds collected in 1988 and 1990 from natural biotopes in the Zailijskij and Dzhungarskij Alatau mountains in Kazakhstan (Dzangalijew, 1977). Seeds were collected from 65 different trees (Dziubiak and Gawryś, 1999).

In the evaluation area of the collection, no pesticides have been used for the last three years. Since 2004, some of the young trees in the nursery have also been included in the evaluation program.

In the exhibition of cultivars recommended for small gardens, trees are grafted on 'Antonovka' seedling and B.9 interstock. Trees in this part of the collection are subject to a complete program of chemical pest and disease control. These trees are not included in evaluation studies.

The chief aim of the evaluation program is to identify which of the varieties in the collection can be recommended for ecological culture in home gardens. Data recorded include the time of the various phenological phases, including growth, blossoming and fruit-bearing (Łukasiewicz, 1984; Rejman, 1994). The estimated value of the crop is also recorded, although this is difficult to do in a

botanical garden because visitors pick the fruits. For all cultivars, fruit morphology and crown shape are recorded. For all species, leaf and blossom morphology is recorded. Fruits are described according to UPOV guidelines. Since 2002, leaf and fruit damage due to apple scab (*Venturia inaequalis* (Cke.) Aderh.) and powdery mildew (*Podosphaera leucotricha* (Ellis et Everh.) have also been recorded.

For winter apples, ripening time and the length of the storage period in the cellar are evaluated. Apples to be stored are picked from the end of September till the middle of October.

Passport data for each accession include origin, if known, site and date of collection, rootstock, date of grafting, date of planting into the collection, and date of first fruiting. All these data are maintained in an electronic database.

RESULTS AND DISCUSSION

The apple trees in the collection begin their vegetative phase at the end of March on average. Wild apple trees generally begin to grow before the cultivated varieties do. The varieties which begin to grow the earliest are *Malus baccata* var. *sibirica* (Maxim.) C.K. Schneid. and *M. baccata* var. *mandshurica* (Maxim.) C.K. Schneid., which begin to grow in the middle of February. Most accessions of *M. sieversii* (Ledeb.) M.Roem. begin to grow at about the same time as the early cultivars. The cultivars which begin to grow the earliest are: 'Kandil Sinap', 'Reneta Weidnera' and 'Reneta Kurska'. The cultivars which begin to grow the latest are 'Royal Courtpendu' and 'Spätblühender Tafetapfel', which also blossom the latest. The trees in the collection blossom in a first half of May. The cultivars which blossom the earliest are 'Spasovka' and 'Red Astrachan'. The cultivars which blossom the latest are 'Minister von Hammerstein' and 'Royal Courtpendu'. The difference in blossoming time between the cultivars which blossom the earliest and the cultivars which blossom the latest is only one week. *M. florentina* (Zuccagni) C.K. Schneid. and *M. ioensis* 'Fimbriata' trees blossom one month later than the other species, at the end of May. Intensity of blossoming and fruiting varies from weak to moderately intense because of pests and diseases. Apples ripen from the end of July till January. Early summer apples include 'Arkad Żółty', 'Oliwka Inflancka' ('Yellow Transparent'), 'Spasovka', 'Red Astrachan' and 'Suislepskie'. Cultivars which ripen in August include 'Ananas Berzenicki', 'Charłamowskie', 'Korobówka' and 'Mnich'. The largest group of apples in the collection are cultivars which ripen in the Autumn. Cultivars which ripen at the end of September include 'Antonówka Zwykła', 'Babuszkino', 'Glogierówka' ('Littauischer Pepping'), 'Kosztela', 'Kronselska' ('Transparent de Croncels') and 'Truskawkowe Nietschnera'. Cultivars which ripen in October and November include 'Malinowa Oberlandzka' ('Oberländer Himbeerapfel'), 'Królowa Renet' ('Winter Goldparmäne'), 'Jakub Lebel' and 'Rarytas Śląski'. Winter cultivars include 'Boiken', 'Muchrik', 'Piękna z Rept', 'Wagenera' and 'Winter Banana'. Some of the winter apples can be stored till May, for example 'Calville de Saint Sauver', 'Gustawa Trwałe' ('Gustaws Dauerapfel'), 'Grochówka' ('Grosse Bohnapfel') and 'Reneta Szampańska' ('Reinette de Champagne').

The study on scab and mildew tolerance which has been carried out over the last three years has indicated that the most tolerant cultivars are 'Antonówka Zwykła', 'Bramley's Seedling', 'Rozmaryn Russkij', 'Lane's Prince Albert', 'Early Victoria', 'Soländer Streifling', 'Spätblühender Tafetapfel', 'Doneszta' and two unidentified cultivars designated 13/96 and 11/97E. Generally, wild apples are more tolerant than cultivated apples. Twenty-one of the accessions had little or no damage due to scab and mildew, including *M. baccata* var. *mandshurica* (Maxim.) C.K. Schneid., *M. coronaria* (L.) Mill., *M. florentina* (Zuccagni) C.K. Schneid., *M. fusca* (Raf.) C.K. Schneid., *M. x micromalus* Makino, and *M. sieboldii* (Regel) Rehder. *M. sieversii* seedlings were moderately susceptible or susceptible like cultivars 'Rajewskie', 'Ribston Pippin', 'Grafsztynek Inflancki' ('Rosenstreifling'), 'Fraas' Sommer Kalvil'.

Precise description of fruits, leaves and flowers allows identification of different species and the detection of incorrect source data. There are some doubts in the case of *M. coronaria* var. *dasycalyx* Rehder, *M. glaucescens* Rehder, *M. prunifolia* var. *rinki* (Koidz.) Rehder, *M. x gloriosa* É.Lemoine, and *M. orthocarpa* Lavallée. Some accessions are seedlings, which means that they are certainly crosses, for example *M. halliana* Koehne, *M. x scheideckerii* Späth ex Zabel, *M. hupehensis* (Pamp.) Rehder, and *M. sylvestris* Mill. There is lack of information in the literature on some species, such as *M. flexilis*, *M. penzenskiana*, *M. upsaliensis*, *M. odorata* and *M. microcarpa*. One accession, acquired under the name *M. ellerwangeriana*, has turned out to be *M. pumila* f. *apetala* (Muenchh.) C.K. Schneid. because its blossoms have no petals. Another accession, acquired under the name *M. ioensis* 'Fimbriata', does not have any features characteristic for *M. ioensis* (A.W. Wood) Britton species (Krüssmann, 1977; Rehder, 1990, Sokolow, 1954). So far, 218 old local cultivars and 100 wild and ornamental genotypes have been described. Other cultivars and genotypes still await classification.

List of wild and ornamental *Malus* species in the collection of the Botanical Garden –
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in Warsaw

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| 1. <i>Malus x adstringens</i> Zabel | 21. <i>M. microcarpa</i> |
| 2. <i>M. x arnoldiana</i> (Rehd.) Sarg. | 22. <i>M. x micromalus</i> Makino |
| 3. <i>M. baccata</i> (L.) Moench var. <i>flavescens</i> | 23. <i>M. odorata</i> hort ex Lavallée |
| 4. <i>M. baccata</i> var. <i>mandshurica</i> (Maxim.) C. K. Schneid. | 24. <i>M. orthocarpa</i> Lavallée |
| 5. <i>M. baccata</i> var. <i>sibirica</i> (Maxim.) C.K. Schneid. | 25. <i>M. penzenskiana</i> |
| 6. <i>M. coronaria</i> (L.) Mill. | 26. <i>M. x platycarpa</i> Rehder |
| 7. <i>M. coronaria</i> var. <i>dasycalyx</i> Rehd. | 27. <i>M. prattii</i> (Hemsl.) C. K. Schneid. |
| 8. <i>M. coronaria</i> 'Red Tip' | 28. <i>M. prunifolia</i> var. <i>rinki</i> (Koidz.) Rehder |
| 9. <i>M. ellerwangeriana</i> | 29. <i>M. prunifolia</i> 'Roter Riesling' |
| 10. <i>M. flexilis</i> | 30. <i>M. pumila</i> Mill. |
| 11. <i>M. florentina</i> (Zuccagni) C. K. Schneid. | 31. <i>M. pumila</i> 'Niedzwietzkyana' |
| 12. <i>M. floribunda</i> Siebold ex Van Houtte | 32. <i>M. x purpurea</i> (Barbier) Rehder |
| 13. <i>M. fusca</i> (Raf.) C. K. Schneid. | 33. <i>M. x robusta</i> 'Dolgo' |
| 14. <i>M. glaucescens</i> Rehder | 34. <i>M. rockii</i> Rehder |
| 15. <i>M. x gloriosa</i> É. Lemoine | 35. <i>M. sargentii</i> Rehder |
| 16. <i>M. halliana</i> Koehne | 36. <i>M. x scheideckerii</i> Späth ex Zabel |
| 17. <i>M. x hartwigii</i> Koehne | 37. <i>M. x scheideckerii</i> 'Hillieri' |
| 18. <i>M. hupehensis</i> (Pamp.) Rehder | 38. <i>M. sieboldii</i> (Regel) Rehder |
| 19. <i>M. ioensis</i> (A. W. Wood) Britton 'Fimbriata' | 39. <i>M. sieboldii</i> var. <i>arborescens</i> Rehder |
| 20. <i>M. kirghisorum</i> Al. Fed. et Fed. | 40. <i>M. sieversii</i> (Ledeb.) M. Roem. |

41. *M. x soulardii* (L. H. Bailey) Britton
 42. *M. spectabilis* (Aiton) Borkh.
 43. *M. sylvestris* Mill.
 44. *M. sylvestris* z Buttstadt

45. *M. toringoides* (Rehder) Hughes
 46. *M. tschonoskii* (Maxim.) C. K. Schneid.
 47. *M. upsaliensis* hort ex Dippel
 48. *M. x zumi* 'Calocarpa'

List of old apple cultivars in the collection of the Botanical Garden – Center for Biological Diversity Conservation of the Polish Academy of Sciences in Warsaw (unnamed accessions are not included)

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| 1. Abondanza | 53. Cox's Pomona |
| 2. Adam Mickiewicz | 54. Cukrówka |
| 3. Adam's Pearmain | 55. Cygany (local name) |
| 4. Adersleber Kalvill | Cynamonówka Ananasowa (Koricznoje) |
| 5. Ajzerowska (local name) | 56. Ananasnoje) |
| 6. Akata | Cynamonówka Prażkowana (Koricznoje) |
| 7. Akerö | 57. Połosatoje) |
| 8. Alpiniszt | 58. Cytrynowe Zimowe |
| 9. Amália | 59. Cytrynówka (Zitronenapfel) |
| 10. Ananas Berzenicka | 60. Czarnodrzewne |
| 11. Anis | 61. Czarnoguz |
| 12. Anis Połosatyj | 62. Czarny Byk |
| 13. Anoka | 63. Czerwonka (local name) |
| 14. Antonówka Diesertnaja | 64. Czubatka (local name) |
| 15. Antonówka Kamienna | 65. Deserowe (local name) |
| 16. Antonówka Kołowa | 66. Dobry Kmiotek (Dobryj Krestianin) |
| 17. Antonówka Mohylewska | 67. Doneszta |
| Antonówka Półtorafuntowa | 68. Duke of Clarens |
| 18. (Śmietankowa) | 69. Dvorčinka |
| 19. Antonówka Stakanczataja | 70. Dziadek (local name) |
| 20. Antonówka Obyknaviennaja | 71. Early Crimson |
| 21. Aporta | 72. Early Victoria |
| 22. Arkad Zimowy | 73. Edelrother |
| 23. Arkad Żółty | Ellisona Pomarańczowa (Ellison's) |
| 24. Babuszkino | 74. Orange) |
| 25. Bankroft | 75. Entz Rozmaring |
| 26. Barnack Beauty | 76. Fameuse |
| 27. Beforest | 77. Fantas alma Bicske |
| 28. Bellfleur Kitajka | 78. Fekete tányér alma |
| 29. Ben Davis | 79. Filippa |
| 30. Beregi Sóvári | Gaskońskie Szkarłatne (Gascoyn's) |
| 31. Berlepsch | 80. Scarlet) |
| 32. Berlepsch Rotherapfel | 81. Glockenapfel |
| 33. Berner Rosen | 82. Glogierówka (Littauischer Pepping) |
| 34. Beziemianka | 83. Gloria Mundi |
| 35. Białe Litewskie | 84. Golden Noble |
| 36. Bielasy (local name) | 85. Gołąbek Nowoangielski (Taubenapfel) |
| 37. Bischofshut | Grafsztynek Czerwony (Grawensteiner) |
| 38. Bismarckapfel | 86. Roter) |
| 39. Blahova Rožena Reneta | 87. Grafsztynek Inflancki (Rosenstreifling) |
| 40. Bochowskie | Grahama Jubileuszowe (Graham's) |
| 41. Bogatyr | 88. Jubiläumsapfel) |
| 42. Boiken | 89. Granny Smith |
| 43. Bramley's Seedling | 90. Grochówka (Grosser Bohnapfel) |
| Brzoskwiniove (Pfirschroter | 91. Grochówka Królewska |
| 44. Sommerapfel) | 92. Gruchoty (local name) |
| 45. Bukówka Biała | 93. Gruszowka Moskowskaja |
| 46. Bursztówka Polska | 94. Gruszowka Rewelska |
| 47. Ceglédi piros Simonffy | 95. Gubener Warraschke |
| 48. Cellini | 96. Gustawa Trwale (Gustaws Dauerapfel) |
| 49. Cesarz Wilhelm (Kaiser Wilhelm) | 97. Gyllenkrok |
| 50. Charles Rosse | 98. Hibernak |
| 51. Chałmowskie (Borovinka) | 99. Ingrid Marie |
| 52. Chodské | 100. Jachontowaja |
| | 101. Jacob alma Ráckeve |

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102. Jadernička Moravská
103. Jakob Lebel
104. Jakubinka (local name)
105. Jantarnoje
106. Jonathan
107. Jugenapfel
108. Kalterer Böhmer
109. Kalville de Saint Sauver
Kalwila Badeńska (Grossherzog von Baden)
110. Kalwila Czerwona Jesienna (Calville Rouge d'Automne)
Kalwila Czerwona Zimowa (Calville Rouge d'Hiver)
111. Kalwila Śnieżna Biała
112. Kalwilla Letnia Fraasa (Fraas' Sommer)
113. Kalvill)
114. Kalwin
115. Kalwinka
116. Kalwinka Ukrainka
117. Kanadyjskie Czerwone
118. Kandil Sinap
Kantówka Gdańska (Danzinger Kantapfel)
119. Kapuśniak (local name)
Kardynalskie (Geflamter Weisser Kardinal)
120. Karin Schneider
121. Kazachstanskoje Jubilejnoje
122. Kecskeméti var. alma
123. Kent
124. King David
125. Kitajka Anisowaja
126. Kogutki (local name)
Koksa Pomarańczowa (Cox's Orange)
127. Pippin)
128. Korobowka
129. Korona Napoleńska
130. Kosztela
131. Kożene
132. Kralické
133. Krasa Reneta (local name)
134. Kragi (local name)
135. Krepla
136. Kronselska (Transparent de Crosels)
137. Królowa Renet (Winter Goldparmäne)
Krótkonózka Królewska (Court Pendu)
138. Rouge)
Książę Albrecht Pruski (Prinz Albrecht von Preussen)
139. Książęca (Prinzenapfel)
140. Księżna Luiza (Prinzessin Louise)
141. Kusaki (local name)
142. Kuzynek
143. Landsberska (Landsberger Renett)
144. Landsberska Szara z Dąbrowic
145. Lane's Prince Albert
146. Laxton's Superb
147. Lord Lambourne
148. Lord Suffield
149. Major
Malinowa Oberlandzka (Oberländer)
150. Himbeerapfel)
151. Malinowe Nowe
152. Mank's Küchenapfel
153. Marie Pinel de la Toule
154. Martini
155. Maśniok (local name)
156. Medůvka
157. Merton Spy
158. Minister von Hammerstein
159. Mišenské
160. Mnich
161. Mohringer Rosenapfel
162. Muchrik
163. Muskat Renette
164. Naliv Rosovyj
165. Napoleon (Cosenza Gentile)
166. Nathusius Taubenapfel
167. Neujahrsapfel
168. Northen Spy
169. Syberyjka (local name)
170. Nyári selymes
171. Odinkowskoje Bielejoje
172. Ohm Paul
Oliwka Czerwona (Astrachanskoje Krasnoje)
173. Oliwka Żółta (Yellow Transparent)
174. Ontario
175. Oranie
176. Oretorpseireinette
177. Orzechówka
178. Owcze Nosy
179. Panenské České
180. Panienska
181. Papierówka Słodka
182. Papirovska Jantarnaja
183. Parówki (local name)
184. Patten 396
185. Peasgood's Nonsuch
186. Pederstrup
187. Peggy's Favourite
188. Peppin Kitajka
189. Pepina Angielska
190. Pepina Linneusza (Gelber Bellefleur)
191. Pepina Ribstona (Ribston Pippin)
192. Pepina Szafranowa
193. Perkins
194. Piękna Ohtarzewska
Piękna z Herrnhut (Schöner aus Herrnhut)
195. Piękna z Rept
196. Pisaki (local name)
197. Poziomka
198. Prieswoschnoje (Stark)
199. Prof. Jankowski
200. Putiwka Osiennaja
201. Queen
202. Rajewskie
203. Rajok
204. Rambour Stichy (Rapa Czerwona)
205. Rapa Zielona
206. Rarytas Śląski
207. Rederka
208. Renet Bergamotnyj
209. Renet Sacharnyj od Miczurina
210. Reneta Baumana
211. Reneta Blenheimska (Blenheim Orange)
212. Reneta Czarniecka

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

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KOLEKCJA RODZAJU *Malus* MILL. W OGRODZIE BOTANICZNYM PAN W WARSZAWIE

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S T R E S Z C Z E N I E

W Ogrodzie Botanicznym – Centrum Zachowania Różnorodności Biologicznej w Warszawie znajduje się kolekcja rodzaju *Malus* Mill. Od 1987 roku do dziś zgromadzono około 700 obiektów, wśród nich 550 historycznych starych odmian szlachealnych uprawianych do czasów II wojny światowej. Stare odmiany pochodzą z instytucji naukowych i prywatnych sadów z terenu Polski i sąsiednich krajów. W części ekspozycyjnej Ogrodu posadzono drzewa 20 odmian polecanych do uprawy na działkach i w ogrodach przydomowych. Kolejną częścią kolekcji są dziko rosnące i dekoracyjne gatunki w liczbie 150 taksonów, wliczając 98 siewek *Malus sieversii* (Ledeb.) M. Roem z naturalnych stanowisk z gór Tiań-Szań.

Od 1995 roku prowadzone są obserwacje fenologiczne, takie jak początek wegetacji, pora i intensywność kwitnienia, pora dojrzewania owoców. Owoce opisuje się na podstawie deskryptora UPOV. Od 2002 roku ocenia się stopień porażenia liści i owoców przez parcha i mączniaka jabłoni. Wszystkie zgromadzone w kolekcji obiekty posiadają dane paszportowe. Dotychczas opisano 218 starych odmian szlachealnych i 100 taksonów *Malus*. Część materiału nadal wymaga identyfikacji. Wybrano 10 odmian i 21 taksonów *Malus* najbardziej odpornych na parcha i mączniaka jabłoni.

Słowa kluczowe: gatunki *Malus*, stare odmiany jabłoni, kolekcja, opis, odporność na parcha