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Conspect and chorology of the genus *Pyrus* L.

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Abstract. The author discussed the history of studies on the systematics of the genus *Pyrus* L. and its intrageneric divisions. In two separate lists he compiled the known taxa of pears. In one he included 38 species and in the other 47 taxa of hybrids and ferals. This division, however, is only tentative and requires further critical studies. The author also compiled a bibliography of the genus covering 104 items, pertaining to the systematics, nomenclature and chorology of pears.

Additional key words: systematics, chorology, *Rosaceae*, *Pyrus*.

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The genus *Pyrus* defined by Linné in 1753 initially covered not only pear-trees but also apple-trees. In spite of the fact that only a year later Miller (*Gard. Dict. abridg. ed. 4*) placed the apples into a separate genus *Malus*, the original classification of Linné has been repeated on numerous occasions, even in recent times (see Meikle, 1966). Besides, in the 19th century also the genus *Sorbus* was treated within the genus *Pyrus*.

Since the time of Linné the number of species of pears has increased substantially, to more than 80, often without a critical evaluation of individual taxa. Still we lack a complete monograph of the genus, though some attempts in this direction have been made. The first study of this type comes from the second half of the 19th century, when Decaisne (1871-72) divided the 23 species of pears known at that time into 6 races (proles), giving them geographic names: celtique, germanique, hellenique, pontique, indique and mongolique.

Twenty years later, Koehne (1890. *Die Gattungen der Pomaceen*, Berlin) described 14 species of pears in two sections:

1. Sectio *Pashia* Koehne – fruits free of sepals with numerous whitish lenticels. Style with 2-5 necks.

2. Sectio *Achras* Koehne (currently the proper name of this section is Sectio *Pyrus*) – fruits with persisting sepals. Style with 5 necks.

This division, with minor modifications, has been maintained until today. However, some doubts arose concerning the restriction of the definition to only one basic trait separating the two sections, namely the presence or absence of sepals on the fruit. It turned out that within the intraspecific variability of some species (e.g. *P. communis*) there appear local forms with fruits having distinct sepals, with rudimentary sepal scars or even without any sepal scars. This, for example, has led to the erroneous classification of *P. rossica* Danilov to section *Pashia*. On the other hand, some traits were underestimated such as fruit colour, occurrence of whitish lenticels and peduncles, which in section *Pyrus* are usually short, thick and stiff, while in section *Pashia* they are usually thin and flexible (Fig. 1). This latter trait is also characteristic for apples (*Malus*) of section *Baccatae* (Rehd.) Rehd.

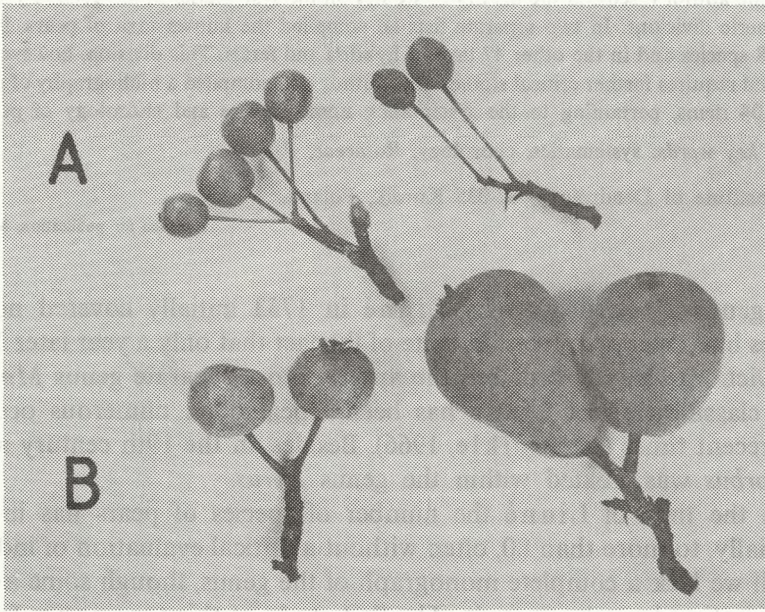


Fig. 1. The differences of the fruit pedicels: A) Sect. *Pashia* – pedicels long, thin and flexible, B) Sect. *Pyrus* – pedicels short, thick and stiff.

The next to make a critical evaluation of the genus *Pyrus* was Schneider (1906), who described 11 species, several debatable taxa of uncertain rank and hybrids. Towards the end of the first half of the 20th century Rehder (1949b) discussed critically the species of *Pyrus* known at that time, particularly as regards their terminology, and he compiled a list of the taxa. The list comprises 23 species with some varieties and forms, and 4 hybrids. Rehder does not mention the sections of Koehne, however, the sequence of species on the list corresponds to a division into these sections.

Fedorov (1954) went even further than Koehne. He described 39 species and added to sections *Pyrus* and *Pashia* two other, *Xeropyrenia* Fed. and *Argyromalon* Fed. These latter two sections he formed especially for numerous small species and hybrids described from the Caucasus. Fedorov's division was recently modified by Tuz (1972), who lowered the rank of these two sections to subsections and together with subsection *Pyrus* placed them in section *Pyrus*. In section *Pashia* he also described 3 subsections. He gave also a key for the identification of 18 species, which he assigned to various subsections as follows:

Sect. 1. *Pashia* Koehne

subject. *Pashia* – *P. betulifolia*, *P. phaeocarpa*, *P. calleryana*, *P. pashia*

subject. *Pyrifoliae* Tuz – *P. pyrifolia*, *P. bretschnideri*, *P. serrulata*

subject. *Ussurienses* Tuz – *P. ussuriensis*

Sect. 2. *Pyrus*

subject. *Pyrus* – *P. communis*, *P. caucasica*, *P. turcomanica*

subject. *Xeropyrenia* (Fed.) Tuz – *P. syriaca*, *P. korshinskyi*, *P. regelii*

subject. *Argyromalon* (Fed.) Tuz – *P. salicifolia*, *P. spinosa*,
P. elaeagnifolia, *P. nivalis*

Besides the studies reviewed above concerning the whole genus *Pyrus*, one should also mention the monograph on Hungarian pears wrote by Terpó (1960), in which he studied in minute detail the variability of some species occurring in that country, particularly of *P. communis* (about 50 forms) and numerous hybrids, some of them triple. A quarter of a century later the same author (Terpó 1985) presented a suggestion for the division of the genus *Pyrus* into 3 sections: *Pyrus*, *Pontica* Decne. and *Pashia* Koehne. The latter two sections he divided into 3 subsections each. Thus in section *Pontica* he recognized subsection *Pontica*, subject. *Xeropyrenia* (Fed.) Tuz and subject. *Mongolica* (Decne) Terpó. Unfortunately, he did not give a characteristic of these taxa but only a split-up of 53 species and hybrids into these divisions.

The above studies concern primarily European species, or west Asiatic ones and to a lesser degree those from east Asia. The latter have been studied by Yü and Ku (1974), who mention 14 species for the flora of China within the two sections of Koehne, among these the cultivated pear *P. communis*, 7 species from section *Pyrus* and 6 from section *Pashia*.

An exact determination of the number of species of pears is exceptionally difficult if not impossible and every attempt in this direction is bound to fail. This is associated with the considerable variability of some species and this variability is probably caused by the ease of hybridization between pears and the formation of numerous, more or less stable segregants, which are given the rank of form, variety or even species. Attempts at artificial self-pollination do not yield almost any positive effects (Zieliński 1965b). On the other hand, the

cross-fertilization of pears in natural conditions is common and all species and hybrids are characterized by the same chromosome number $2n=34$. Some deviations from this can be found in cultivars and as Gladkova and Sveschnikova (1990) report, *Pyrus canjon* (probably one of the cultivated varieties of *P. lindleyi*) has a $2n$ value of 42 and 43.

The frequent natural hybridization within the genus *Pyrus* occurs primarily between species of section *Pyrus* and is most common in the Caucasus and in the Balkan peninsula. Richest in this respect is the Caucasus, particularly Armeniya, where more or less half of all *Pyrus* "species" occur. There are several reasons for this. On the one hand, there is very diversified landscape configuration, high mountains neighbouring directly with deep valleys and lowlands, while more or less mesophilous forests border on xerophytic thickets and steppes. On the other hand, this is a region of an ancient horticultural tradition, where through centuries several varieties of local importance have been selected and remnants of them persist until this day near abandoned and forgotten villages. Thus hybridization has taken place and possibly still takes place between such species as *P. communis* subsp. *caucasica* (a mesophilous species) and the more xerothermic *P. salicifolia*, *P. syriaca* and *P. zangezura*, and possibly also with *P. elaeagnifolia*, not known today from the Caucasus but occurring in neighbouring Turkey. These hybrids most probably crossed with cultivated forms which resulted in the formation of whole polyhybrid swarms. All of this makes it very difficult to qualify as species taxa that frequently occur on only one stand or are represented by single individuals.

The second area of considerable hybridization is the Balkan peninsula, particularly its northern part. The largest number of hybrids was found in Hungary (Terpó 1960), there, however, different species participate in the hybridization than in the Caucasus, namely *P. communis* subsp. *communis* and subsp. *sativa*, *P. nivalis*, *P. salvifolia*, *P. austriaca*, and even the introduced there *P. syriaca*. On the other hand, in Bulgaria hybrids are formed by *P. elaeagnifolia*, s.l., *P. spinosa* and *P. communis* s.l. Hybrids between the latter two pears are also known in Greece (personal observations).

The range of the genus *Pyrus* has been described by Fedorov (1954), however, only in very general terms. On this map he has indicated also the northern limit of pear cultivation, which in Europe runs more or less $5-10^\circ$ further north than the limit of occurrence of wild species of pears. According to Fedorov, this range is continuous, even though in Iran, Turkmeniya and Afghanistan there are larger or smaller gaps in the range (see Browicz 1992 Arbor. Kórnickie 37). Besides Fedorov's range did not cover the whole Iberian peninsula, where pears do occur, for example throughout Portugal (Franco, Afonso 1965). The limit of the range of *Pyrus* in China, also an approximate one, has been described by Lee (1948).

The range of the genus *Pyrus* lies primarily in the Temperate zone of the northern hemisphere and only exceptionally enters the most northwestern tip of Africa. In North America pears do not occur. The range consists of three parts. The first one covers central, western and southern Europe, northwest Africa and southwestern parts of Asia, from Anatolia to the Caucasus and Turkmeniya in the east and to central Israel in the south. Here the northern, western and southern limits are defined by species from section *Pyrus*. In the north, *P. communis* reaches Latvia and Russia to about 55-57° Lat., while in the south *P. syriaca* reaches Israel as far as the Judean Mts. and in southwestern Iran, in province Fars, it goes only slightly beyond 30° Lat.

The second part of the range extends from southwestern Afghanistan through northern Pakistan, the Himalayas to central and eastern China and to Japan. Here furthest to the north grows *P. ussuriensis* in the Russian Far East more or less as far north as 50° Lat. The most easterly stands occur in Japan, including species *P. ussuriensis*, *P. calleryana* and *P. pyrifolia*. Also in central Taiwan there is *P. kawakami*. On the other hand, the southern limit is defined by *P. pashia* from section *Pashia*, which is known also in northern Viet Nam and in Laos, south of the Tropic of Cancer, down to about 22-23° Lat.

Finally, the third and smallest part of the range is located between the former two, but has no connection with them. It is represented by only three species: *P. korshinskyi*, *P. regelii* and *P. tadshikistanica*, all from section *Pyrus*. Here the range extends between 42° Lat. in the mountains of Tyan Shan and 34° Lat. in northern Afghanistan. Thus almost the whole of central and southern Iran, Afghanistan and Pakistan are beyond the region of natural occurrence of pears.

Richest in pears is the Caucasus, from where about 40 taxa have been described, though most of them are hybrids or ferals. In China there are 13 species, in Turkey 9, in Iran 6, in Europe 4-5, in Japan 3, in Tadzhikistan 3 and in Afghanistan 2. In vertical distribution pears grow from coastal lowlands, extending up into the mountains, usually no higher than to about 2000 m. In the Himalayas there is *P. pashia* at even higher elevations, up to 2750 m, and in China *P. pashia* and *P. pseudopashia* reach 3000 m.

Below a list of all the species in alphabetical order is given. A similar list of hybrids and ferals is enclosed. Next to each species the sources are cited, also the more important synonyms are given as well as taxa of lower order (subsp. or var.). A short description is given of the geographic distribution, both horizontal and vertical. Moreover, the references on the range maps are also indicated. At the end a bibliography is given of the most important works (mainly Russian) in the field of systematics and geography of the genus *Pyrus*, while publications concerning breeding and cultivation of pears were excluded.

PYRUS L., SPEC. PL. 479 (1753)

1. *Pyrus armeniacaefolia* Yü, Acta Phytotax. Sin. 8, 3: 231 (1963).

General distr.: China (Sinkiang).

2. *Pyrus betulaefolia* Bunge, Mém. Div. Sav. Acad. Sci. St. Pétersb. 2: 101 (1835).

General distr.: China – 50-1800 m.

3. *Pyrus boissieriana* Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 87 (1860).

General distr.: Talish, N. Iran, Turkmeniya – 600-2400 m.

Maps: Grossheim 1952, Browicz 1973, Svjazeva 1980, Browicz 1982a.

4. *Pyrus bretschneideri* Rehd., Proc. Am. Acad. Arts Sci. 50: 231 (1915).

General distr.: China – 100-2000 m.

Maps: Lee 1948.

5. *Pyrus calleryana* Decne., Jard. Fruit. 1: 329 (1871-72).

Variability: var. *integrifolia* Yü, Acta Phytotax. Sin. 8, 3: 232 (1963).

var. *koehnei* (C. Schneider) Yü, Fl. Rep. Pop. Sinicae 36: 370 (1974).

var. *lanceolata* Rehd., J. Arnold Arbor. 6: 28 (1926).

var. *dimorphophylla* (Makino) Koidz., J. Coll. Sc. Tokyo 34, 2: 56 (1913).

General distr.: China, Japan (Honshu), N. Viet Nam (?), 800-1800 m.

6. *Pyrus communis* L. s. l., Sp. Pl. 479 (1753).

Variability:

a) in Europe:

subsp. *communis* (Syn. *P. achras* Gaertner, Fruct. Sem. 2: 44 (1791); *P. pyraster* Burgsd., Ableit Erzieh. Holzart 2: 193 (1787). – wild forms.

subsp. *sativa* (DC.) Hegi, Ill. Fl. Mittel-Eur. 4, 2: 698 (1922). – cultivated forms.

subsp. *rossica* (Danilov) Tuz, Kultur. Fl. SSSR 14: 155 (1983) (= *P. rossica* Danilov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 15: 126. 1953).

b) in Caucasus and Anatolia

subsp. *caucasica* (Fed.) Browicz, in P. H. Davis Fl. Turkey 4: 163 (1972). (= *P. caucasica* Fed. in Grossheim Fl. Kavkaza 5: 422. 1952).

c) in Africa

subsp. *mamorensis* (Trabut) Maire, Fl. Afr. Nord 15: 112 (1980). (= *P. mamorensis* Trabut, Bull. Stat. Recherch. For. N. Afr. 1: 118. 1916).

subsp. *longipes* (Cosson et Durand) Maire, Fl. Afr. Nord 15: 113 (1980). (= *P. longipes* Cosson et Durand, Bull. Soc. Bot. France 2: 310. 1855; *P. cossonii* Rehd. J. Arnold Arb. 27: 317. 1946).

subsp. *gharbiana* (Trabut) Maire, Fl. Afr. Nord 15: 113 (1980). (= *P. gharbiana* Trabut, Bull. Stat. Recherch. For. N. Afr. 1: 117. 1916).

General distr.: Europe, N.W. Africa, Caucasus, Anatolia.

Maps: Svjazeva 1980, Browicz 1992.

7. *Pyrus bourgeana* Decne., Jard. Fruit. 1: t. 2 (1871).

General distr.: Portugal, Spain, Morocco.

Maps: Franco, Afonso 1965.

Probably it is one of the extreme forms of *P. communis* s. l.

8. *Pyrus cordata* Desv., Obs. Pl. Angers 152 (1818).

General distr.: Western margin of Europe.

Probably it is one of the cultivated forms of *P. communis* s. l.

9. *Pyrus elaeagnifolia* Pallas, Nova Acta Acad. Sci. Imp. Petrop. 7: 355 (1793).
 Variability: subsp. *kotschyana* (Boiss. ex Decne) Browicz, P. H. Davis Fl. Turkey 4: 167 (1972).
 (= *P. kotschyana* Boiss. ex Decne, Jard. Fruit. 1: t. 18 (1871-72); *P. taochia* Woronow, Trudy Prikl. Bot. Selek. 14, 3: 84 (1925)).
 subsp. *bulgarica* (Kuth. et Sachokia) Valev, Fl. NR Bylgarija 5: 338 (1973) (= *P. bulgarica* Kuth. et Sachokia, Zametki Sist. Geogr. Rast. Tbilisi 26: 80. 1967).
 General distr.: Turkey, Crimea, E. Balkan Peninsula – 100-1850 m.
 Maps: Svjazeva 1980, Browicz 1982a.
10. *Pyrus farsistanica* Browicz, Arbor. Kórnickie 27: 27 (1982).
 General distr. S. Iran.
 Maps: Browicz 1982b.
11. *Pyrus fauriei* C. Schneider, Ill. Handb. Laubholzk. 1: 666 (1906).
 General distr.: Korea.
 Probably it is only a dwarf form of *P. calleryana*.
12. *Pyrus hakkiarica* Browicz, Notes. Roy. Bot. Gard. Edinburgh 31: 322 (1972).
 General distr.: S. Anatolia – 1200-1550 m.
13. *Pyrus hyrcana* Fed., in Grossheim Fl. Kavkaza ed. 2., 5: 421 (1952).
 General distr.: Azerbaydshan (Talish), N. Iran.
 Maps: Grossheim 1952, Svjazeva 1980.
14. *Pyrus kandavanica* Ghahreman, Khatamsaz et Mozaffarian, Iran. J. Bot. 5, 1: 2 (1991).
 General distr.: N. Iran (Mazanderan).
 This species reminds *P. ussuriensis* Maxim. var. *heterophylla* Gladkova.
15. *Pyrus kawakamii* Hayata, J. Coll. Sci. Tokyo 30, 1: 99 (Mat. Fl. Formos.) (1911).
 General distr.: Central part of Taiwan – 500-1000 m.
 The species is probably cospecific to *P. calleryana* var. *koehnei*.
16. *Pyrus ketzkhovellii* Kuth. Zametki Sist. Geogr. Ras. Tbilisi 13: 23 (1947).
 General distr.: Caucasus – Gruziya, Armeniya, Azerbaydzhan – 700-800 m.
 Maps: Grossheim 1952, Svjazeva 1980.
17. *Pyrus korshinskiyi* Litv.: Trudy Bot. Muz. Imp. Akad. Nauk 1: 17 (1902).
 Syn.: *P. bucharica* Litv. ibid. 1: 18 (1902); *P. erythrocarpa* Vassilcz., Refer. Naučn.-Issled. Rabot Otd. Biol.-Nauk Akad. Nauk SSSR (1945); 5: (1947); *P. tuskaulensis* Vassilcz. Bjull. Moskovsk. Obšč. Isp. Prir. Otd. Biol. 84, 4: 108 (1979).
 General distr.: Tadjhikistan, Uzbekistan, Kirgiziya, N. Afghanistan – 1000-2000 m.
 Maps: Zaprjagaeva 1964, Svjazeva 1980, Browicz 1982a.
18. *Pyrus lindleyi* Rehd., Proc. Am. Acad. Arts Sci. 50: 230 (1915).
 Syn.: *P. sinensis* auct.; *P. cajon* Zaprjag. Dikorast. Plod. Tadjhikistana 388 (1964).
 General distr.: China, Tadjhikistan (W. Pamir) – 1500-2500 m.
19. *Pyrus mazanderanica* Schönb.-Tem., in K.H. Rechinger Fl. Iranica 66: 32 (1969).
 General distr.: N. Iran – 1900-2400 m.
 Maybe it is a form of *P. hyrcana*.
20. *Pyrus nivalis* Jacq., Fl. Austr. 2: 4 t. 107 (1774).
 General distr.: S. and S.C. Europe.
21. *Pyrus oxyprion* Woronow, Izv. Glavn. Bot. Sada SSSR 26, 6: 608 (1927).
 General distr.: Caucasus – Gruziya, Armeniya, NE Turkey, NW Iran – up to 1700 m.
 Maps: Grossheim 1952, Browicz 1974, Svjazeva 1980, Browicz 1992.

Notice: Probably *Pyrus fedorovii* Kuth. (Zametki Sist. Geogr. Ras. Tbilisi 13: 27 (1947) and *P. hajastana* Mulk. (Dokl. Akad. Nauk Armjansk. SSR 48, 4: 234 (1969)) can be recognized as forms of *P. oxyprion*.

22. *Pyrus pashia* Buch-Ham. ex D. Don, Fl. Nepal. 256 (1825).

Syn.: *P. variolosa* Wallich, Cat. no. 668 (1828) nomen nudum; G. Don. Gen. Syst. Dichlam. Pl. 2: 622 (1832).

Variability: var. *kumaoni* Stapf. in Bot. Mag. 135: t. 8256 (1909)

var. *obtusata* Card., in Lecomte, Not. Syst. 3: 346 (1918).

var. *grandiflora* Card., in Lecomte Not. Syst. 3: 346 (1918).

General distr.: E. Afghanistan, N. Pakistan, N. India up to China, N. Viet Nam and Laos – 650-3000 m.

Maps: Browicz 1991.

23. *Pyrus phaeocarpa* Rehd., Proc. Am. Acad. Arts Sci. 50: 235 (1915).

General distr.: China – 100-1200 m.

24. *Pyrus pseudopashia* Yü, Acta Phytotax. Sin. 8, 3: 232 (1963).

General distr.: China (Yunnan, Kweichow) – 550-3000 m.

25. *Pyrus pyrifolia* (Burm. f.) Nakai, Bot. Mag. Tokyo 40: 564 (1926).

Syn.: *P. serotina* Rehd., Proc. Am. Acad. Arts Sci. 50: 231 (1915); *P. sinensis* auct. Jap., non Poiret (1816).

Variability: var. *talyschensis* Gladkova, Novost. System. Vysš. Ras. 25: 102 (1988).

var. *culata* (Makino) Nakai, Bot. Mag. Tokyo 40: 564 (1926).

General distr.: China, Japan – 1000-1400 m.

Maps: Lee 1948.

26. *Pyrus regelii* Rehd., J. Arnold Arb. 20: 97 (1939).

Syn.: *P. heterophylla* Regel et Schmalh., Trudy St. Petersb. Bot. Sada 5, 2: 581 (1878) non Pott (1800).

General distr.: Tadzhikistan, Uzbekistan, Kirgiziya – 700-2000 m.

Maps: Zaprjagaeva 1964, Svjazeva 1980.

27. *Pyrus salicifolia* Pallas, Reise Prov. Russ. Reich 3: 734, t. N. fig. 3, A.B. (1776).

Syn.: *P. argyrophylla* Diapulis, Feddes Repert. 34: 39 (1933).

General distr.: Caucasus, N.E. Turkey, N.W. Iran – 300-1900 m.

Maps: Grossheim 1952, Svjazeva 1980, Browicz 1982a.

28. *Pyrus serrulata* Rehd., Proc. Am. Acad. Arts Sci. 50: 234 (1915).

General distr.: China – 100-1500 m.

29. *Pyrus sinkiangensis* Yü, Acta Phytotax. Sin. 8, 3: 233 (1963).

General distr.: China (Kansu) – 200-1000 m.

30. *Pyrus spinosa* Forsskal, Fl. Aegypt-Arab. 211 (1775).

Syn.: *P. amygdaliformis* Vill., Cat. Méth. Jard. Strasb. 323 (1807).

General distr.: S. Europe, W. Anatolia – up to 1500 m.

Maps: Browicz 1982a.

31. *Pyrus syriaca* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 10: 1 (1849).

Variability: subsp. *glabra* (Boiss.) Browicz, *comb. nov.* (= *P. glabra* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 53 (1845)).

General distr.: S. Caucasus, Anatolia, Cyprus, Syria, Lebanon, Israel, Jordania, S.W. Iran – 300-2300 m.

Maps: Browicz 1972c, 1982a, Svjazeva 1980.

32. *Pyrus tadshikistanica* Zaprj., Dikorast. Plod. Tadžikistana 378 (1964).
Syn. *P. ferganensis* Vassilcz., Bjull. Moskovsk. Obšč. Isp. Prir. Otd. Biol. 84, 4: 108 (1979).
General distr.: Tadshikistan, Kirgiziya – 1200-2350 m.
Probably it is only a form of *P. turcomanica*.
33. *Pyrus theodorovii* Mulk., Dokl. Akad. Nauk Armjansk. SSR 40, 4: 249 (1969).
General distr.: S. Armeniya – 1500-1600 m.
Maps: Svjazeva 1980.
34. *Pyrus turcomanica* Maleev, Turdy Bot. Inst. Akad. Nauk SSSR Ser. 1., 3: 196 (1937).
General distr.: S. Turkmeniya, N. Iran (?), Transcaucasus.
Maps: Svjazeva 1980.
35. *Pyrus ussuriensis* Maxim., Bull. Cl. Phys.-Math. Acad. Imp. Sci. St. Petersburg 15: 135 (1857).
Syn.: *P. ovoidea* Rehd., Proc. Am. Acad. Arts Sci. 50: 228 (1915);
P. asiae-mediae (Popov) Maleev, Fl. SSSR 9: 342 (1939);
P. sogdiana Kudrj., Plod. Szachrisjaba 1: 78 (1950).
General distr.: Far East of Russia, Korea, N.E. China – 100-2000 m.
Maps: Lee 1948, Svjazeva 1980.
36. *Pyrus xerophila* Yü, Acta Phytotax. Sin. 8, 3: 233 (1963).
General distr.: China (Kansu, Shensi, Shansi) – 500-2000 m.
37. *Pyrus yaltiriki* Browicz, Orman Faktült. Dergisi, Istanbul Univ. Ser. A., 24, 2: 57 (1974).
General distr.: E. Anatolia – 1200 m.
Maps: Browicz 1974.
38. *Pyrus zangezura* Maleev, Trudy Bot. Inst. Akad. Nauk SSSR ser. 1., 3: 195 (1937).
General distr.: Armeniya – up to 1900 m.
Maps: Grossheim 1952, Svjazeva 1980.

The list represented above is probably somewhat overstated, because some taxa can be treated as hybrids or forms.

HYBRIDS AND FERALS

1. *Pyrus* × *acutiserrata* Gladk. Novost. Sist. Vysš. Ras. 23: 104 (1987).
Distrib.: S. Transcaucasus (Armeniya, Azerbajdshan, Nakhiczewan).
Probably *P. syriaca* × *P. elaeagnifolia*.
2. *Pyrus* × *amphigenea* Domin ex Dostálek, Folia Geobot. Phytotax. 34, 1: 105 (1989).
Pyrus communis subsp. *communis* × subsp. *sativa*.
3. *Pyrus* × *anatolica* Browicz, Notes Roy. Bot. Gard. Edinburgh 31: 323 (1972).
Distrib.: W. Anatolia – 1000 m.
Probably it is a selected triple hybrid of *P. communis* × *P. spinosa* × *P. elaeagnifolia*.
4. *Pyrus* × *armud* Hausskn. ex Bornm. Mitt. Thüring. Bot. Ver. 1890: 17.
Distrib.: N. Anatolia.
P. communis × *P. elaeagnifolia*.
5. *Pyrus* × *austriaca* Kerner, Sched. Fl. Exicc. Austro-Hung. 7, 15 No. 2437 (1897).
Distrib.: C. Europe.
P. communis × *P. nivalis*.

6. *Pyrus* × *babadagensis* Prodan, Bull. Stiint. Acad. Rep. Popul. Romine, Sect. Biol. Stiint. Agric. Ser. Bot. 9: 325 (1957).

Distrib.: E. Romania.

P. communis × *P. elaeagnifolia* subsp. *bulgarica*.

7. *Pyrus balansae* Decne., Jard. Fruit. 1: t. 6 (1871-72).

Probably it is only a cultivated form of *P. communis* subsp. *sativa*.

8. *Pyrus* × *bardoënis* Dostálek, Folia Geobot. Phytotax. 19, 1: 90 (1984).

Distrib. Bulgaria – 850 m.

P. elaeagnifolia × *P. spinosa*.

9. *Pyrus browiczii* Mulk., Dokl. Akad. Nauk Armjansk. SSR 48, 4: 235 (1969).

Distrib.: Armeniya – 1700 m.

Probably cultivarietas, related to *P. elata*.

10. *Pyrus* × *chorsovica* Gladk., Novost. Sist. Vysš. Ras. 27: 70 (1990).

Distr.: Armeniya – 1700 m.

Agg. of *P. georgica*.

11. *Pyrus* × *complexa* Rubtzov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 9, 2: 80 (1941).

Distrib.: S. Armeniya – 1700-2000 m.

Probably *P. syriaca* × *P. communis* subsp. *caucasica* × *P. salicifolia*.

12. *Pyrus costata* Sumn., Fl. Uzbekistana 3: 795 (1955).

Distrib.: Uzbekistan.

Probably it is one of the cultivated forms of *P. communis*.

13. *Pyrus* × *daralagezi* Mulk. Dokl. Akad. Nauk Armjansk. SSR 48, 4: 236 (1969).

Distrib.: S. Armeniya – 1700-1800 m.

P. syriaca × *P. zangezura*.

14. *Pyrus* × *decaisneana* Terpó, Ann. Acad. Horti Viticult. 22, 6, 2: 37 (1960).

Distrib.: France, Macedonia, Hungary.

P. cordata × *P. communis* subsp. *communis*.

15. *Pyrus demetrii* Kuth., Zаметki Sist. Geogr. Rast. Tbilisi. 13: 25 (1947).

Distrib.: Gruziya.

Probably it is a feral form of *P. communis* s.l.

16. *Pyrus elata* Rubtzov., Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 9, 2: 72 (1941).

Distrib.: S. Armeniya – 2000 m.

Cultivarietas.

17. *Pyrus eldarica* Grossh., Izv. Azerbajd. Fil. Akad. Nauk SSSR 10: 35 (1944).

Distrib.: Azerbajdshan – 700-800 m.

Feral – probably identical with *P. sosnovskyi*.

18. *Pyrus* × *georgica* Kuth., Zаметki Sist. Georg. Ras. Tbilisi 8: 13 (1939).

Distr.: Gruziya.

Probably *P. communis* subsp. *caucasica* × *P. syriaca*.

19. *Pyrus* × *gergerana* Gladk., Novosti Sist. Vysš. Ras. 27:70 (1990).

Distrib.: Armeniya.

Agg. of *P. takhtadzianii*.

20. *Pyrus* × *grossheimii* Fed., Trudy Armen. Fil. Akad. Nauk SSSR, Ser. Biol. 2: 205 (1937).

Distrib.: Azerbajdshan (Talish).

P. hyrcana × *P. ussuriensis*.

21. *Pyrus* × *hazslinszkyana* Terpó, Ann. Acad. Horti Viticult. 22, 6, 2: 165 (1960).
Distrib.: Hungary.
P. communis subsp. *communis* × *P. salvifolia*.
22. *Pyrus* × *hopeiensis* Yü, Acta Phytotax. Sin. 8, 3: 232 (1963).
Distrib.: China (Hopei) – 100-800 m.
Probably *P. ussuriensis* × *P. phaeocarpa*.
23. *Pyrus* × *jordanovii* Dostálek, Folia Geobot. Phytotax. 19, 1: 92 (1984).
Distrib.: Bulgaria (Pirin) – 350 m.
P. communis × *P. spinosa*.
24. *Pyrus* × *karpatiana* Terpó, Ann. Horti. Viticult. 22, 6, 2: 35 (1960).
Distrib.: Hungary.
P. magyarica × *P. communis* s.l.
25. *Pyrus* × *lecontei* Rehd., J. Arnold Arb. 7: 28 (1926).
P. communis × *P. pyrifolia*.
26. *Pyrus magyarica* Terpó, Ann. Acad. Horti. Viticult. 22, 6, 2: 34 (1960).
Distrib.: Hungary.
Probably only cultivarietas of *P. communis*.
27. *Pyrus* × *mecsekensis* Terpó, Ann. Acad. Horti Viticult. 22, 6, 2: 133 (1960).
Distrib.: Hungary.
P. communis subsp. *communis* × *P. spinosa*.
28. *Pyrus* × *medvedevii* Rubtzov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 9, 2: 77 (1941).
Distrib.: Armeniya, Nakhiczevan – 2000 m.
Probably *P. salicifolia* × *P. syriaca*.
29. *Pyrus* × *michauxii* Bosc. ex Poiret Encycl. Méth. Bot. Suppl. 4: 452 (1816).
? *P. spinosa* × *P. nivalis*.
30. *Pyrus* × *mohacszyana* Terpó, Ann. Acad. Horti. Viticult. 22, 6, 2: 173 (1960).
Distrib.: Hungary.
P. communis subsp. *communis* × *P. nivalis* × *P. syriaca*.
31. *Pyrus* × *megricea* Gladk., Novosti Sist. Vysš. Ras. 27: 72 (1990).
Distrib.: S. Armeniya.
Agg. of *P. georgica*.
32. *Pyrus* × *nutans* Rubtzov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 9, 2: 74 (1941).
Distrib.: S. Armeniya – 1900-2000 m.
Probably *P. communis* × *P. syriaca*.
33. *Pyrus* × *pannonica* Terpó, Ann. Acad. Horti Viticult. 22, 6, 2: 148 (1960).
Distrib.: Hungary.
P. communis subsp. *communis* × *P. nivalis*.
34. *Pyrus* × *pomazensis* Terpó, Ann. Acad. Horti Viticult. 22, 6, 2: 167 (1960).
Distrib.: Hungary.
P. nivalis × *P. spinosa*.
35. *Pyrus* × *praenorica* Terpó, Ann. Acad. Horti Viticult. 22, 6, 2: 145 (1960).
Distrib.: Hungary.
P. austriaca × *P. communis* subsp. *communis*.

36. *Pyrus* × *pseudosyriaca* Gládk., *Novosti Sist. Vysš. Ras.* 26: 107 (1989).
 Distrib.: Armeniya.
 Probably *P. syriaca* × *P. salicifolia*.
37. *Pyrus raddeana* Woronow, *Trudy Prikl. Bot. Genet. Selekc.* 26: 608 (1925).
 Distrib.: Armeniya.
 Feral form.
38. *Pyrus* × *sachokiana* Kuth., *Soobšč. Akad. Nauk Gruz. SSR* 3, 9: 915 (1942).
 Distrib.: Gruzija.
 Probably nothovarietas of *P. georgica*.
39. *Pyrus* × *salvifolia* DC., *Prodr.* 2: 634 (1825).
 Syn.: *P. slavonica* Kit., apud Javork., *Bot. Közlem.* 14: 65 (1915).
 Distrib.: Europe.
P. nivalis × *P. communis* (or *P. spinosa*?).
40. *Pyrus sosnovskiyi* Fed., *Sborn. nauč. trud. Bot. obšč. Armjansk. SSR i Armjansk. Fil. Akad. Nauk SSSR* 1: 5 (1938).
 Distrib.: S. Armeniya.
 Feral of *P. communis* s.l.
41. *Pyrus* × *takhtadzianii* Fed., *Trudy Arm. Fil. Akad. Nauk SSSR* 2: 208 (1937).
 Distrib.: A. Armeniya, Gruzija – 800-1700 m.
 Cultivarietas – probably *P. communis* × *P. elaeagnifolia*.
42. *Pyrus tamamschianae* Fed., in Grossheim *Fl. Kavkaza* ed. 2., 5: 422 (1952).
 Distrib.: Armeniya.
 Probably feral form of *P. communis* s.l.
43. *Pyrus* × *transdubica* Terpó, *Ann. Acad. Horti Viticult.* 22. 6, 2: 168 (1960).
 Distrib.: Hungary.
P. communis subsp. *communis* × *P. austriaca*.
44. *Pyrus* × *vavilovii* Popov, *Trudy Prikl. Bot. Genet. Selekc.* 22, 3: 403 (1929).
 Distrib.: Middle Asia.
P. communis × *P. korshinskyi* or *P. turcomanica* × *P. korshinskyi*.
45. *Pyrus* × *velenovskiyi* Dostálek, *Folia Geobot. Phytotax.* 19, 1: 91 (1984).
 Distrib.: Bulgaria.
P. communis s.l. × *P. spinosa*.
46. *Pyrus* × *voronovii* Rubtz., *Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR* 9, 2: 76 (1941).
 Distrib.: Armeniya.
 Probably *P. syriaca* × *P. salicifolia*.
47. *Pyrus vsevolodii* Heideman, *Izv. Azerbajdh. Fil. Akad. Nauk SSSR* 2: 76 (1941).
 Distrib.: Azerbajdshan.
 Feral form of *P. communis* s.l.

INTERGENERIC HYBRIDS

Pyronia (*Cydonia* × *Pyrus*) Veitch

Proc. Roy. Hort. Soc. London 37: XXXII (1911) nomen; 38: XXXIV (1912).

1. *Pyronia* + *danieli* (Daniel) Rehd., *J. Arnold Arb.* 7: 148 (1926)

Cydonia oblonga × *Pyrus communis* – graft hybrid.

2. *Pyronia* × *veitchii* (Trabut) Guillaumin, Bull. Soc. Dendr. France 1925: 64 (1925).
Cydonia oblonga × *Pyrus communis* – sexual hybrid.

Sorbopyrus (*Pyrus* × *Sorbus*) C. Schneider

Ill. Handb. Laubholz. 1: 666 (1906).

1. *Sorbopyrus* × *auricularis* (Knoop) C. Schneider, Ill. Handb. Laubholz. 1: 666, fig. 365a-1 (1906).
Pyrus communis × *Sorbus aria*.

Pyrus × *Malus*

Artificial hybrids between the cultural forms of these two genera was obtained, but the results was rather poor (see: Crane, Marks 1952; Gorshkova 1962).

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SUMMARY

The genus *Pyrus* has not been treated monographically as yet, nonetheless, there are several papers of similar character, such as those of Decaisne (1871-72), Koehne (1893), Schneider (1906), Rehder (1949a and b), Terpó (1960, 1985) and Tuz (1972). The division of the genus proposed by Koehne (1890) into two sections, *Pyrus* and *Pashia*, still maintains, with minor modifications, its utility. The number of species of pears is difficult to determine because various hybrids and forms have frequently been treated as independent taxa. There are about 80 of these. The author made an attempt at separating pears into two groups: 1. species and 2. hybrids and forms both cultivated and gone wild. However, this division is only approximate and would require further critical studies. The taxa have been listed in alphabetical order, with 38 in the first group and 47 in the second. For each of these the first descriptions are quoted as well as possible synonyms, the variability is discussed and the overall geographic distribution and also data is quoted about published range maps. The author also quotes intergeneric hybrids of *Pyrus* with *Sorbus*, *Cydonia* and *Malus* and finally a bibliography of the more important literature on the systematics, nomenclature and chorology of the genus.

Konspekt i chorologia rodzaju *Pyrus* L.

STRESZCZENIE

Rodzaj *Pyrus* L. nie był jak dotąd monograficznie opracowany, niemniej znanych jest kilka prac o podobnym charakterze, jak np.: Decaisne (1871-72), Koehne (1893), Schneider (1906), Rehder (1949a i b), Terpó (1960, 1985) oraz Tuz (1972). Utworzony przez Koehne'go (1890) podział rodzaju na dwie sekcje: *Pyrus* i *Pashia*, utrzymał z pewnymi modyfikacjami swoje znaczenie po dziś dzień. Liczba gatunków grusz jest trudna do określenia, gdyż niejednokrotnie różnego rodzaju mieszańce oraz formy traktowane były jako samodzielne taksony, jest ich około 80. Autor podjął próbę ich rozdzielenia na dwie grupy: 1. gatunki i 2. mieszańce, formy zdziczałe i uprawne. Podział ten jest jednak tylko przybliżony i wymaga dalszych krytycznych studiów. Taksony te zostały zestawione w porządku alfabetycznym, a mianowicie 38 w pierwszej grupie i 47 w grupie drugiej. Dla każdego z nich cytowane są pierwsze opisy i ewentualne synonimy, omówiona jest zmienność oraz ogólne rozmieszczenie geograficzne, a także przytoczone są dane o opublikowanych mapach zasięgowych. Autor wspomina również mieszańce międzyrodzajowe rodzaju *Pyrus* z *Sorbus*, *Cydonia* i *Malus* a także na zakończenie załącza bibliografię ważniejszych pozycji literatury z zakresu systematyki, nomenklatury i chorologii rodzaju.

