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Pyrus taxa in Hungary, and their practical importance

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ABSTRACT: Wild and cultivated Hungarian *Pyrus* taxa have been grouped with respect to their origin. The species can be classified to three sections: *Pyrus, Pontica* and *Pashia. Pyrus pyraster, P. caucasica, P. mecsekensis, P. slavonica, P. nivalis, P. austriaca, P.* x *pannonica, P. magyarica and P.* x *karpatiana* were found to occur in Hungary. Only few additional species are planted in Botanical Gardens, e. g., *P. salicifolia.*

KEYWORDS: *Pyrus,* origin, classification, practical importance

Introduction

The occurrence of the genus *Pyrus* in the Carpathian Basin dates back to the Tertiary. *Pyrus* cf. *pyraster* grew together with species of the genera *Fraxinus, Prunus, Fagus, Quercus, Carpinus, Salix, Alnus* cf. *incana, Berberis, Staphylea. Carpinus betulus, Fagus orientalis, Quercus* cf. *castaneaefolia* etc. were identified paleobotanically (ANDREÁNSZKY 1954).

The above taxa formed deciduous forests whose herb and shrub layers included some subtropical and tropical plants as well. The climate of this territory was similar to the recent one with the exception of slightly higher temperature and more precipitation.

The above arguments prove that the wild *Pyrus* species came into being earlier than the cultivated ones. (Some authors still believe that the wild plants are derived from the taxa that escaped from cultivation.)

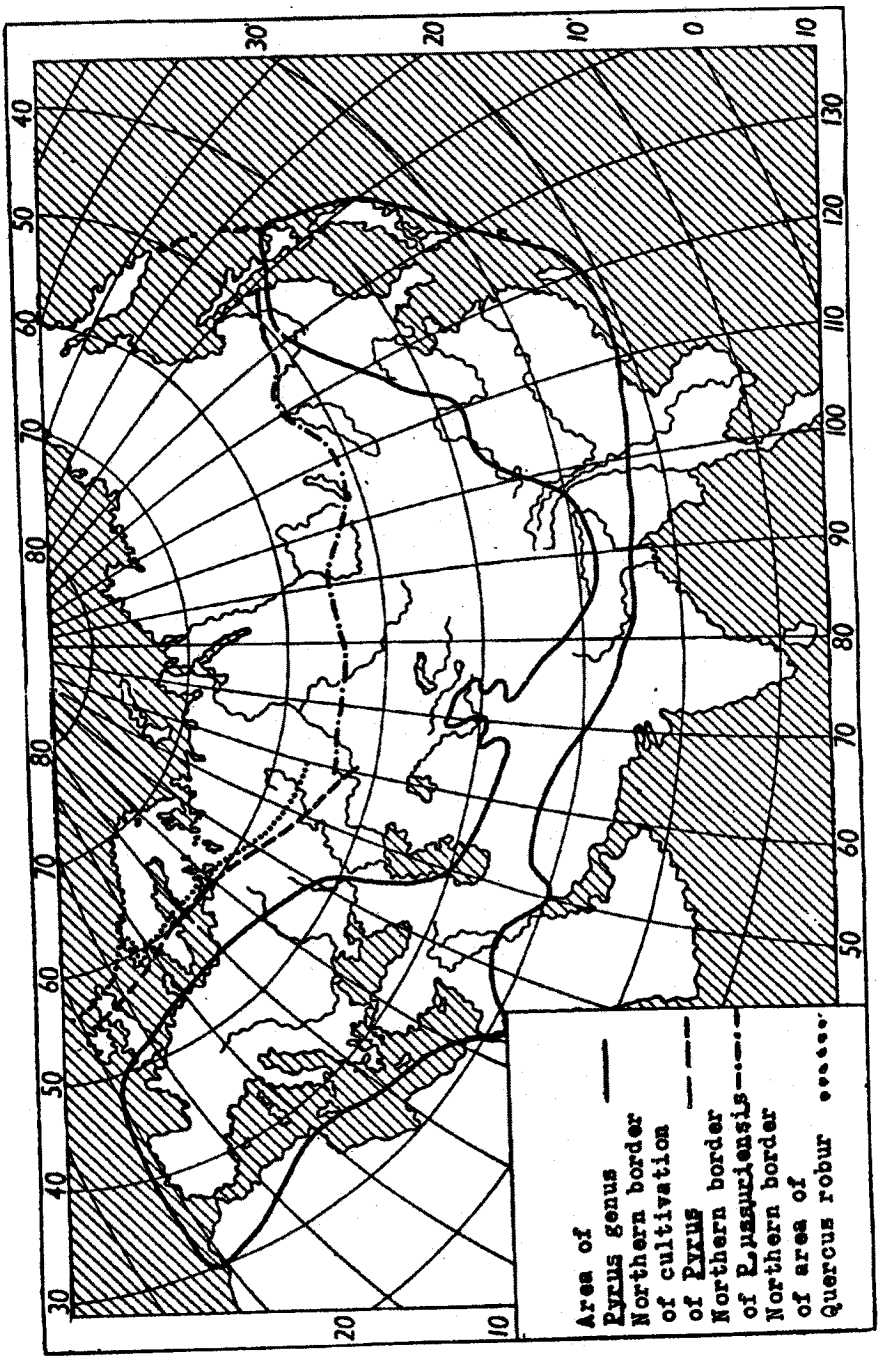


Fig. 1. Geographical distribution of the genus *Pyrus* (on the data of FEDOROV and VASSILCZENKO).

Grouping of *Pyrus* taxa concerning the in origin

I have been dealing with this topic about 30 years. Concerning my results I propose the grouping of wild and cultivated *Pyrus* taxa as follows:

1. Autochtonous species: *P. pyraster, P. caucasica* (Mecsek Mt.), *P. cordata, P. magyarica, P. rossica, P. slavonica, P. spinosa* (amygdaliformis), *P. bourgaeana, P. salviifolia, P. austriaca, P.* x *pannonica, P.* x *karpatiana* etc.

2. Escaped pear (taxa)
2.1. Escaped species; *P. syriaca* in Hungary
2.2. Escaped cultivars, for example Bartlett de Boston(Williams Christbirne), Bosc

3. Wild hybrids of *P. communis* and *P. pyraster,* i.e. *P.* x *amphigenea* DOMIN ex DOSTÁLEK (escaped plants)

4. Cultivated pear
4.1. Cultivated cultivars of *P. communis*
4.2. Local cultivars of wild species (domesticated): *P. spinosa, P. nivalis* etc.
4.3. Populations of pear species cultivated for stock, namely plantations of wild pears cultivated for getting propagating material.
4.4. Cultivated species for ornamental purpose, e.g. *P. salicifolia.*

Classification of *Pyrus* species

Sectio 1.: *Pyrus* (Syn.: *Achras* KOEHNE)
P. pyraster BURGSD., *P. caucasica* FED., *P. bourgaeana* DECNE., *P. grossheimi* FED., *P. hyrcana* FED., *P. tadshikistanica* ZAPR., *P. turcomanica* MALEEV, *P. balansae* DECNE., *P. mecsekensis* TERPÓ.
Sectio 2.: *Pontica* DECAISNE 1858.
subsectio 2.1.: *Pontica* DECAISNE emend. TERPÓ (Syn.: *Argyromalon* FED.).
P. spinosa FORKS., (*P. amygdaliformis* VILL.), *P. elaeagrifolia*PALL., *P. nivalis* JACQ., *P. slavonica* KIT., (syn.: *P. bulgarica*), *P. austriaca* KERN., *P. salicifolia* PALL., *P. amud* HAUSSKN., *P. anatolica* BROWICZ, *P. complexa* RUBTZ., *P. raddeana* WORON., *P. taochia* WORON., *P. x pannonica* TERPÓ etc.
subsectio 2.2.: *Xeropyrenia* FED.
P. syriaca BOISS., *P. regelii* REHD., *P. korshinskyi* LITW., *P. zangezura* MALEEV., *P. voronowii* RUBTZ., *P. nutans* RUBTZ., *P. oxyprion* WORON., *P. federovii* KUTH., *P. ketzkhovelii* KUTH., *P. hakkiarica* BROWICZ, *P. yaltiriki* BROWICZ, etc.

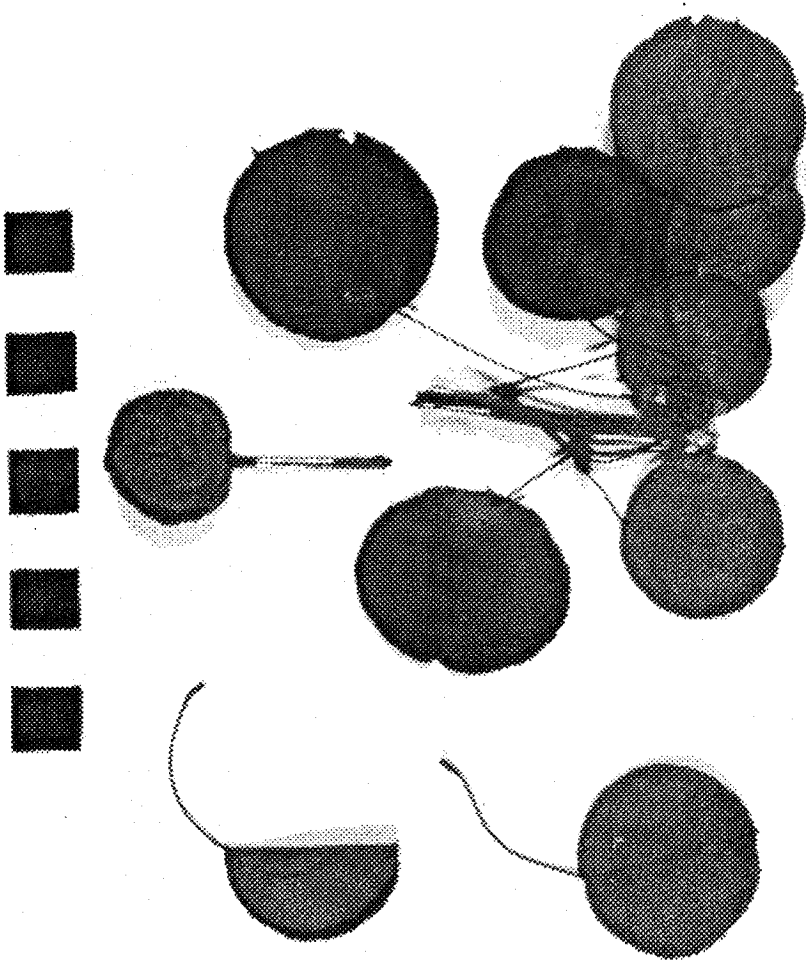


Fig. 2. *Pyrus pyraster* f. *cyclophylla* (MURR.) TERPÓ, Hungary, Transdanubia

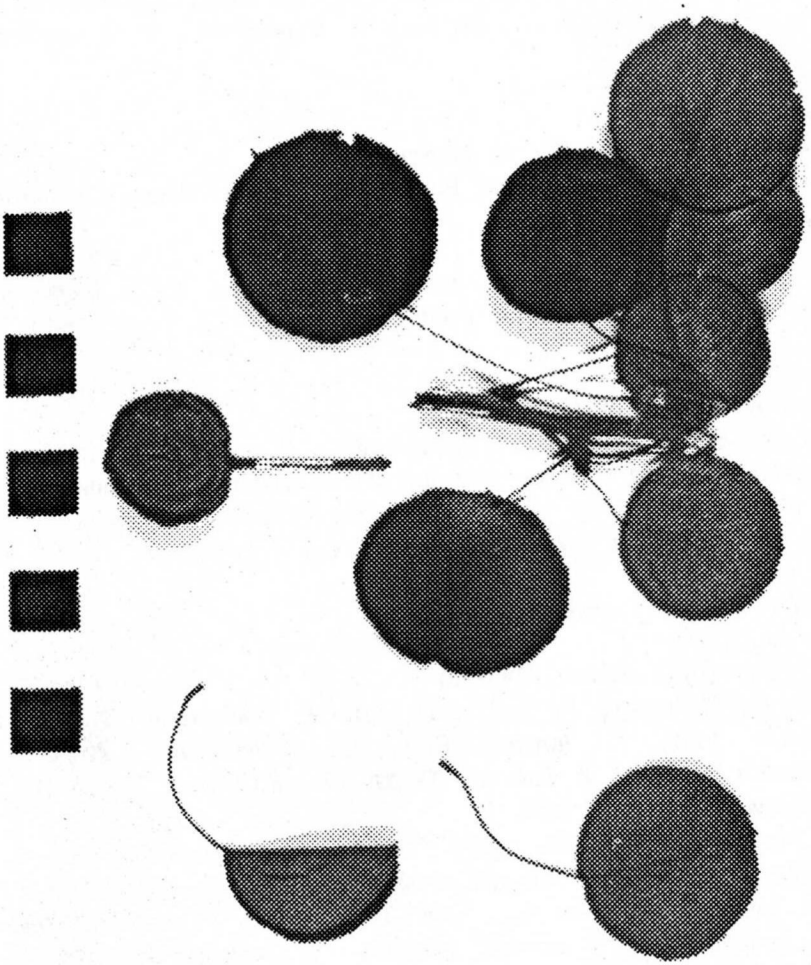


Fig. 2. *Pyrus pyraster* f. *cyclophylla* (MURR.) TERPÓ, Hungary, Transdanubia

subsectio 2.3.: *Mongolica* (DECNE.) TERPÓ
(Syn.: *Sinensis* MALEEV.)
P. aromatica KIKUCHI et NAKAI, *P. lindleyi* REHD., *P. hondonensis* KIKUCHI et NAKAI, *P. ovoidea* REHD., (*P. ussuriensis* var. *ovoidea* REHD.), *P. ussuriensis* MAXIM., (*P. asiae-mediae* (M. POP.)MALEEV.).
Sectio 3.: *Pashia* KOEHNE
subsectio 3.1.: *Armoricana* (DECNE.) TERPÓ
P. boissieriana BUHSE, *P. cordata* DESV., *P. cossonii* REHD., *P.* x *kárpátiana* TERPÓ, *P. magyarica* TERPÓ, *P. rossica* DANILOV.
subsectio 3.2.: *Pashia*
P. calleryana DECNE., *P. betulifolia* BGE., *P. faurieri* SCHNEID., *P. pashia* HAM., *P. phaeocarpa* REHD., *P. pseudopashia* JÜ.
subsectio 3.3.: *Pyrifolia* TUZ.
P. bretschneideri REHD., *P. pyrifolia* (BURM. f.) NAKAI, *P. uyematsuana* MAK., *P. serrulata* REHD.

Survey of *Pyrus* Taxa in Hungary

1. *Pyrus pyraster* BURGDS.
Leaves: rounded, ovate, elliptic-ovate
Fruits: globose, depressed-subglobose, globose-ovoid, turbinate, pyriform.
subsp. *pyraster*
leaves: glabrous, rounded, subrounded, cordate, elliptic-ovate
fruits: globose, depressed-subglobose, turbinate,
f. *pyraster, f. cordifolia, f. spathulata, f. populifolia, f. applanata*
var. *javorkae* PÉNZES
var. *elongata*(NYÁR.) TERPÓ
var. *penzesiana* TERPÓ
var. *brachypoda* (KERN.) TERPÓ
subsp. *achras* (WALLR.) TERPÓ (p.p. var. *tomentosa* KOCH)
leaves: pubescent beneath, usually ovate, orbicularovate to elliptic
fruits: pyriform or turbinate. West Europe.
var. *achras*
f. *achras,* f. *ovalis*
var. *platycarpa* GILLOT,
f. *platycarpa,* f. *microphylla*
2. *Pyrus caucasica* FED.
Leaves orbicular-ovate, ovate, acuminate, entire, ciliate and slightly pubescent.
Fruit turbinate or subglobose (Mecsek Mt.), calyx persistent.

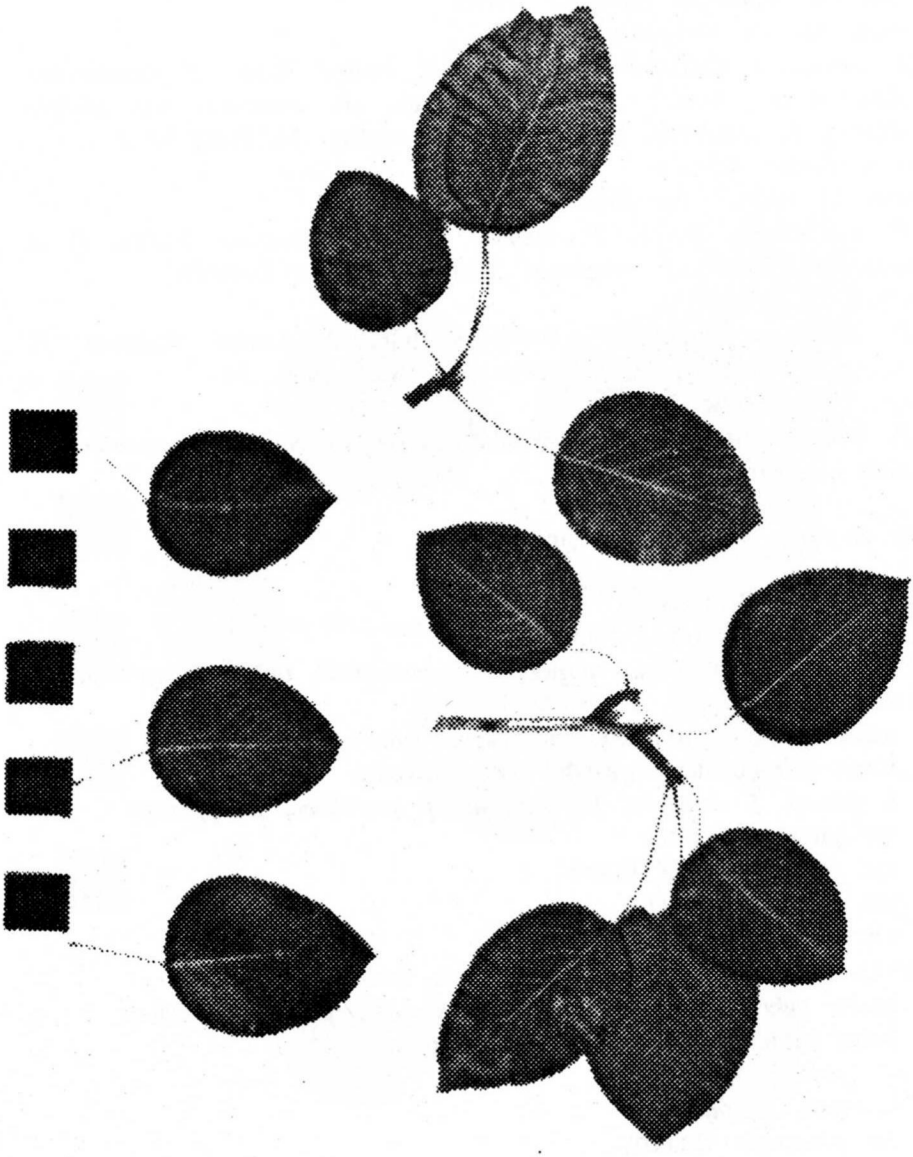


Fig. 3. *Pyrus magyarica* TERPÓ, Central Hungarian Mountain range (Pilis Mts.)

3. *Pyrus mecsekensis* TERPÓ.
   Leaves ovate-lanceolate, lanceolate, crenulate, glabrous.
   Fruit subglobose or turbinate, calyx persistent.
4. *Pyrus slavonica* KIT.
   Tree with spiny branches.
   Leaves ovate, lanceolata, elliptical or obovate, tomentose when young.
   Fruit subglobose, turbinate or ovoid. From the Central Hungarian Mts. to Balkan Peninsula.
5. *Pyrus nivalis* JACQU. subsp. *orientalis* (TERPÓ) TERPÓ
   (Syn.: P. *nivalis* var. *orientalis* TERPÓ 1960).
   Shrub or small tree with stout erect, spiny branches. Twigs stout white tomentose when young. Leaves obovate and lanceolate, cuneate at base, sligthly crenulate at apex, tomentose on both sides, often glabrescent above. Petiole 20-55 mm. Fruit sligthly depressed globose, turbinate or ovoid. The Central Hungarian Mts. Several varieties are known: *schilberszkyana, bereczkiana, canaliculata, pallidifolia.* Dry places (*Stipetum tirsae*).
6. *Pyrus austriaca* A. KERNER.
   Large tree with black branches, greyish tomentose when young. Leaves obovate, lanceolate, glabrescens above. Fruit turbinate or pyriform. W. Hungary (C. and S. Europe).
7. *Pyrus x pannonica* TERPÓ (P. *nivalis* subsp. *orientalis* x *pyraster*) (p. p. var. *tomentosa* KOCH).
   Tree or shrub with spiny branches. Twigs tomentose while young. Leaves obovate, lanceolate, elliptical or orbicular. Fruit subglobose to turbinate. The Central Hungarian Mts.
8. *P. magyarica* TERPÓ, Small tree, with spiny branches. Leaves ovate, subcordate, aristate-dentate. Fruit not densely covered with lenticels, calyx decidous. Woods and hedged in the Central Hungarian Mts.

The *Pyrus* taxa are able to hybridize spontaneously. Thus the crossing between the planted and wild trees is permanent. The change in the genetic material is one cause of the wide variability among the wild populations.

P. x karpatiana TERPÓ (syn. *P. pyraster,* var. *relicta* DOSTALEK 1991). Rare plant of the Pannonian region. This hybrid lives south of the Moesz line. In the territory of Slovakia it can be found in Kováčovské kopce and Hajnáčka (according to DOSTÁLEK 1979).



Fig. 4. *Pyrus nivalis* JACQ. subsp. *orientalis* TERPÓ Central Hungarian Mountain range (Pilis Mts.)

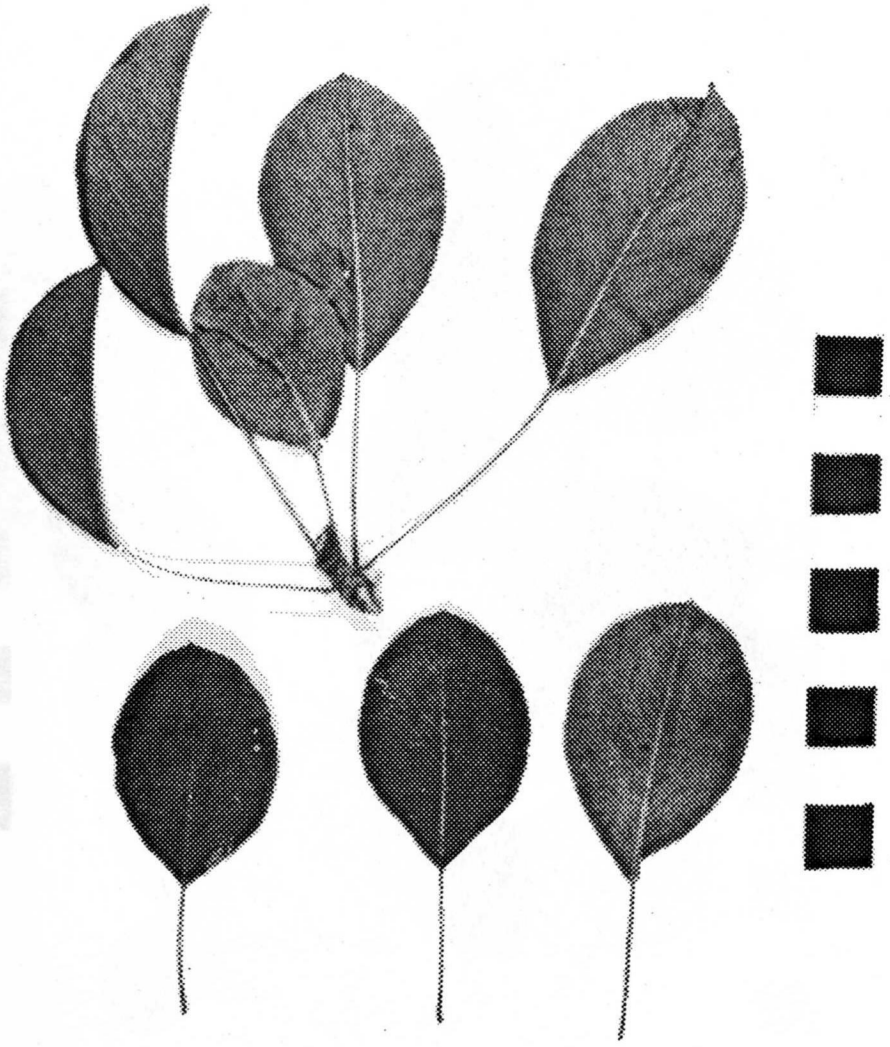


Fig. 5. *Pyrus* x *pannonica* TERPÓ var. *pannonica* TERPÓ, Central Hungarian Mountain range

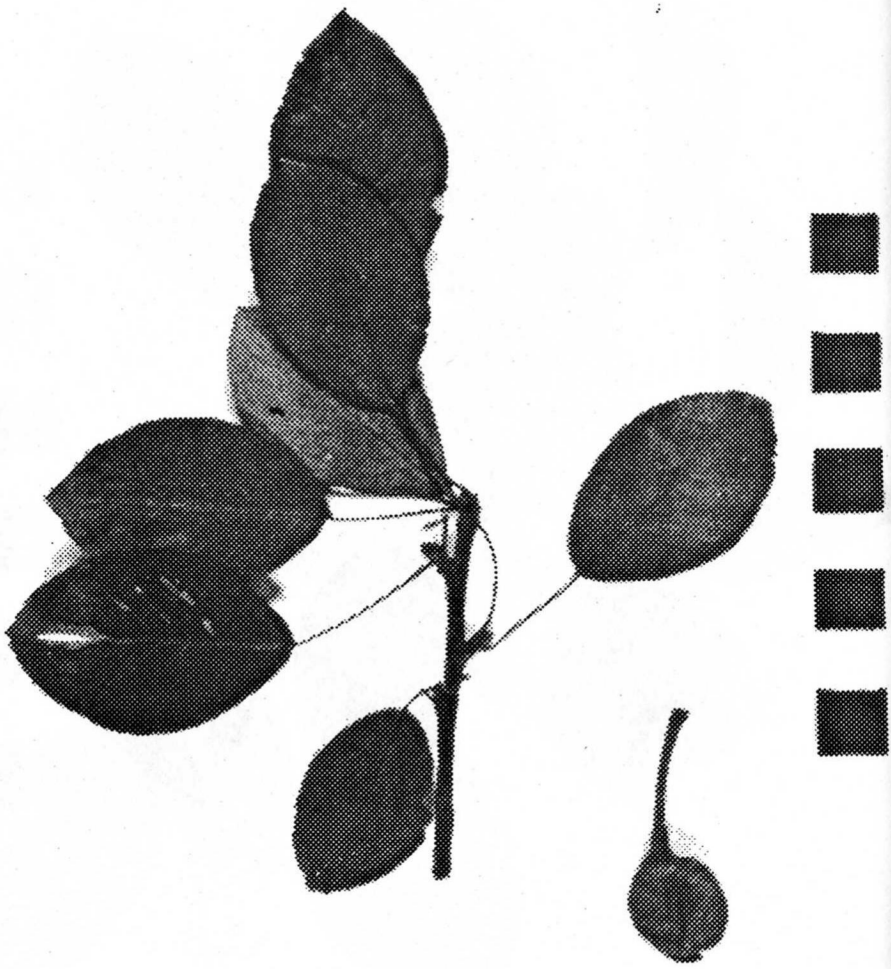


Fig. 6. *Pyrus* x *pannonica* TERPÓ var. *laurifolia* TERPÓ Hungary. Pilis Mts. Pomáz

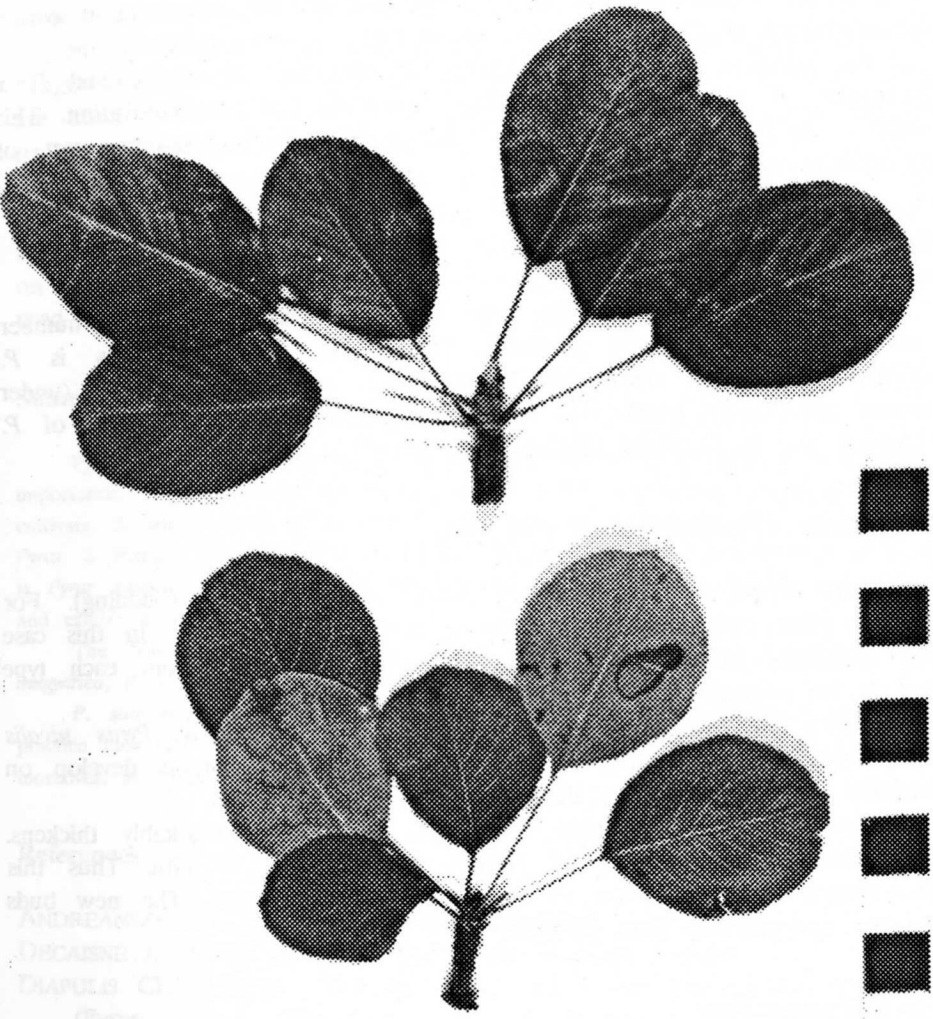


Fig. 7. *Pyrus* x *pannonica* TERPÓ var. *farinosa* TERPÓ Hungary. Pilis Mts., Szentendre (Pécsin)

Distribution, occurrence

In Hungary, the Great Hungarian lowlands. *Pyrus pyraster* lives mo often in the forests composed of *Quercus robur.* In the mountains it occu in associations of *Quercus cerris* or, more rarely, *Quercus petraea.*

The northern limit of *P. magyarica, P. slavonica, P. nivalis,* and *P. pannonica (P. nivalis x pyraster)* coincide with that of vine cultivation. Th limit is called the MOESZ line and is situated in southern part Slovakia (TERPÓ et al. 1988).

Collections in Botanical Gardens

In European botanic gardens there live *Pyrus* taxa in a limited numb and mostly not correctly identified. The most frequent species is *salicifolia.* Besides, *P. elaeagrifolia, P. nivalis, P. austriaca, P. pyraster* (und various names), *P. pashia* are cultivated as well. Several old trees of *slavonica* live in Botanical Garden of Debrecen.

Importance of propagation of wild types

Their propagation is made by seeds or by grafting (budding). F creating plant collections the budding is used most frequently. In this ca the rootstocks are also wild pears. Ten grafts are made from each ty and in the collection remain generally only three trees.

Suckers are developing in the case of *P. x pannonica, Pyrus niva* subsp. *orientalis* and, rarely, *P. pyraster.* The buds and shoots develop branches of roots of various diameter.

After developing the new shoots, the basal root remarkably thicke There increase the quantity of phloem and the rays of pith. Thus th phenomenon does not point to any pathological symptome. The new bu organize endogenously from pericycle.

Practical importance

The *Pyrus* taxa are of great value. Their timber is suitable for grafti and sculpture. From the fruits juice and brandy can be prepared. In t horticulture they are used as rootstocks or ornamental plants.

Recently we have performed experiments with using the wild pear as pollinating partner. In the rows of pear plantation every seventh tree is

selected wild pear. By this method the cultivars get pollen of wild pears, both by the insects (mostly the bees) and by wind.

The suckers are used often as rootstock. This method essentially corresponds to the cloning procedure. It can be used with good results for propagating in botanical gardens as well.

Finally I should like to mention the damage of trees. The most dangerous organisms are the *Quadraspidiotus perniciosus*. The young shoots are offen eaten in the winter by deer. On the other hand, the wild pear fruits serve as food of wild animals.

The deforestation causes damage and genetic erosion as well. In this case only several trees remain, mostly with large fruits. Some taxa - mostly infraspecific ones - are lost by this activity. Moreover, the pear trees living on pastures - originating from forests - got extinct when the territory was used for agricultural purpose.

Summary

Pyrus species are grouped into the following classes on the basis of their practical importance: 1. autochtonous species, 2. escaped taxa, 2.1. escaped species, 2.2. escaped cultivars, 3. wild hybrids, 4. cultivated taxa. Species belong to the following sections: 1. *Pyrus*, 2. *Pontica*, 3. *Pashia*. One of the most comon species of temperate zone of Europe is *Pyrus pyraster*. This species can often be found both in Czechoslovakia and Hungary, and exhibis great variability.

The following rare species live in Hungary: *P. slavonica*, *P.* x *pannonica*, *P. magyarica*, *P.* x *karpatica*, *P. caucasica*.

P. slavonica and *P.* x *pannonica* are able to produce polycormons as well. In practice they can be used as ornamental plants, rootstocks, objects of genetical studies and, moreover, as fruits and juice producing trees.

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DOSTÁLEK J. (1979): Gibt es auf dem Gebiete der Tschechoslowakei relikte Birnen (Pyrus) aus der Sektion Pashia? - Preslia 51: 203-211.

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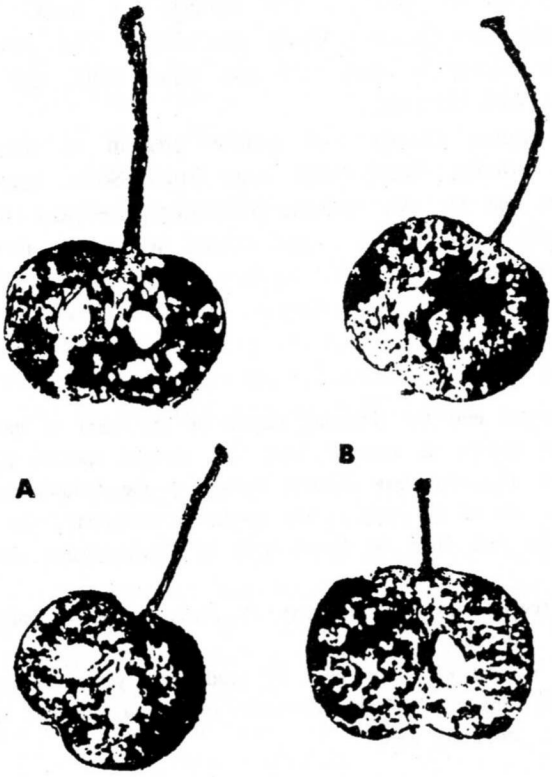


Fig. 8. A) *Pyrus* x *pannonica* var. *pannonica,* B) *Pyrus* x *pannonica* var. *farinosa*

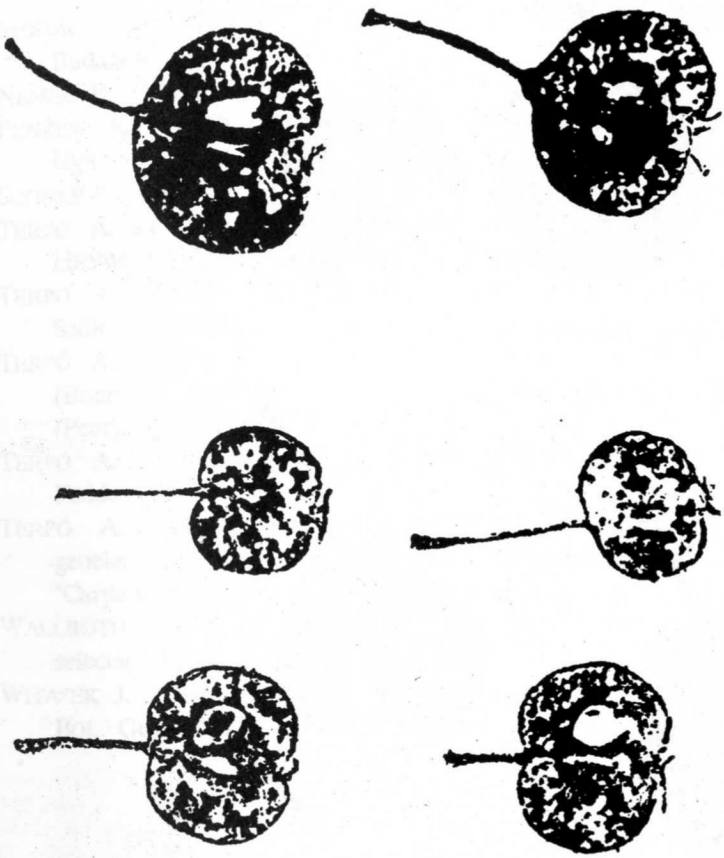


Fig. 9. Fruit type of *Pyrus pyraster* BURGDS.

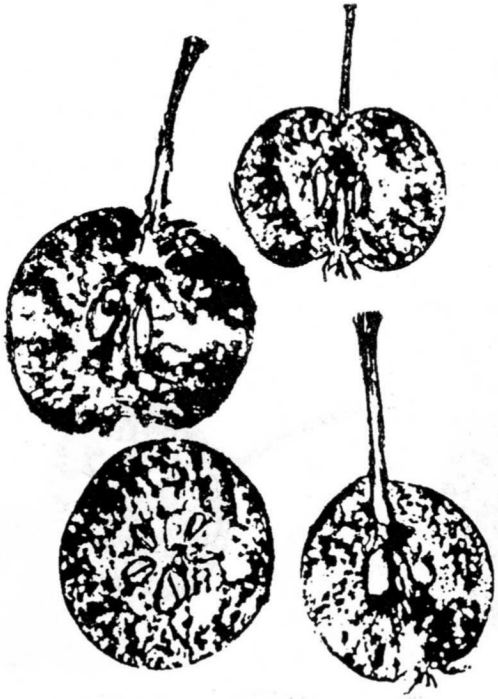


Fig. 10. Fruits of *Pyrus slavonica* KIT.

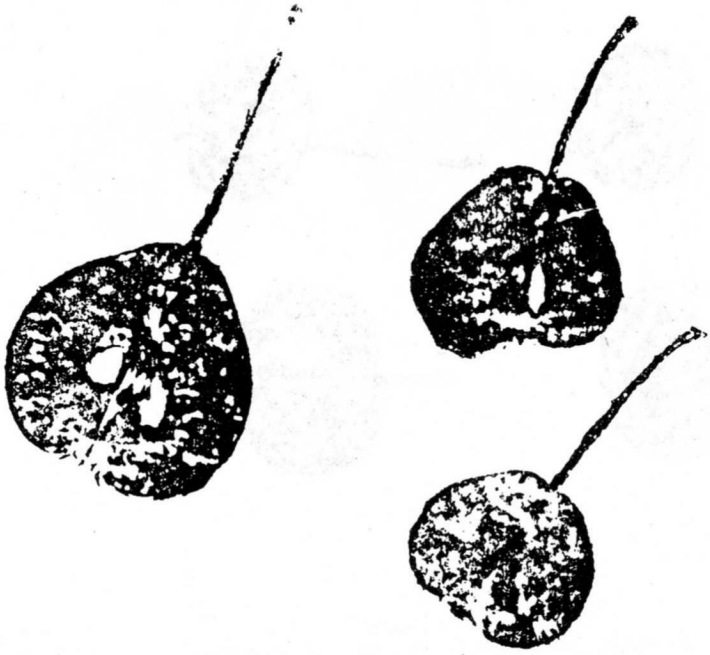


Fig. 11. Fruits of *Pyrus amphigenea* DOMIN.

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