

The name of the apple

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Abstract

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Introduction

In preparing an account of the watercolour drawings of Arthur Harry Church (Mabberley 2000), the first author was confronted with the fact that there is no consensus on the Latin binomial to be applied to the common apple. Despite apples being the most important temperate fruit crop, not only in Australia, but worldwide (Zohary & Hopf 1988: 151), this seemingly simple matter has not been resolved.

For some 70 or 80 years, apples have been referred to the genus *Malus* Mill. (Rosaceae), though Church, the Edwardian botanist and artist, like most of his contemporaries, worldwide, referred to it as *Pyrus malus* L.

Apples in Australia

No *Malus* (or *Pyrus*) species is native in Australia but, since early colonial times, apples have become naturalised and some cultivars of world importance have been raised here. The most famous is, perhaps, ‘Granny Smith’. By 1924, Herbert Rumsey, a Dundas orchardist and local historian (Rumsey 1924, also *Sydney Morning Herald* 6 Nov 1936 [see Tucker & Co. [1938]]) could write that the ‘Granny Smith’ apple was “the most valuable of all apples grown in Australia”. However its origin was even by then anecdotal, according to those who could remember the first grower, Maria Ann Smith (1799–1870), née Sherwood, of Peasmarsh, Sussex, UK, who had arrived in Australia in November 1838 (Spurway n.d.). Her husband, Thomas, bought land in what is now Eastwood, a suburb of Sydney, in 1855 and 1856. According to the story related to Rumsey, Mrs Smith returned from the Sydney Markets with some gin crates, which had contained the rotting remains of some ‘French Crab’ apples from Tasmania. She tipped the mess into a creek on her land and, by 1868, she was able to show visitors the resulting tree from which all ‘Granny Smith’ apple trees have been derived.

Until recently, ‘Granny Smith’, like all orchard apples, was thought to have had a complex hybrid ancestry involving a number of species native in Central Asia, *M. sieversii* (Ledeb.) M. Roem. being important in the lineage. DNA studies and fieldwork (Robinson et al., 2001) have shown on the one hand that there is no evidence from nuclear ITS and chloroplast *matK* sequence analysis to support the view that

hybridisation with other *Malus* spp. took place during the westerly migration of the orchard apple and, on the other, that '*M. sieversii*' is just one aspect of very variable but monospecific wild apple populations in Central Asia. In these populations forms can be found resembling the major groups of cultivated apples seen in Europe and taken thence around the world; for a popular account of these stands where 'every tree is a different variety', see Browning (1998: 60).

Latin names for orchard apples

'Granny Smith' is therefore a cultivar of that Asiatic wild *Malus*, but what is the correct binomial to apply to the species? It may seem almost incredible to laypeople that scientists cannot agree on the name for so common and important a plant as the apple (cf. Corner 1946), for, despite the fact that some authors have recently settled on (the illegitimate) name, *M. domestica* Borkh., following Korban & Skirvin (1984), though the most recent published opinion (Kartesz & Gandhi 1992) argues for *M. sylvestris*, there is disarray in the popular as well as systematic and floristic literature. In current use are a number of names, used as species or as hybrid names — *M. communis* Desf. (e.g. the *International Book of Fruit* and used consistently in many French books in the nineteenth century), *M. domestica* (Mansfeld 1986: 355–63; Given & Sykes 1988; Terpó 1988; Harden & Rodd 1990; Vaughan & Geissler 1997: 52–61), *M. pumila* (Rehder 1949; Zohary & Hopf 1988, 1994; Le Bon Jardinier ed. 153 1992; Ghjora & Panigrahi 1995), *M. sylvestris* (Browicz 1972; Symon 1986; Maxwell et al. 1988, as subsp. *mitis*); yet other names have been used in the past.

Linnaeus's apple names

Most of these names ultimately rest on names published in the works of Linnaeus, who included apples under the genus *Pyrus*. It is therefore necessary to examine Linnaeus's names and to typify them, thereby typifying *Malus* names based on them. These typifications refer to the Linnaean names and do not affect 'standards' for cultivar names.

As with citrus fruit (Mabberley 1997b), DJM needed to clarify this matter for updating *The Plant-book* (Mabberley 1987, 1997a), as well as for the book on Church's work, and approached CEJ, coordinator of the Linnaean Plant Name Typification Project, and BEJ, pomologist and supervisor of the DNA work in Oxford.

2. PYRUS foliis ferratis, pomis basi concavis. *Hort. cliff. Malus.*
 189. *Hort. ups.* 130. *Fl. suec.* 402. *Mat. med.* 237.
Roy. lugdb. 266. *Hall. helv.* 351.
Malus sylvestris. *Baub. pin.* 435. *Dod. pempt.* 790. *sylvestris.*
 β. *Malus pumila*, quæ potius frutex quam arbor. *Baub. paradifiaca.*
pin. 433.
 γ. *Malus praefomila.* *Baub. pin.* 433. *praefomila.*
 δ. *Malus fativa*, fructu sanguinei coloris ex austero sub-
dulci. *Tournef. inst.* 635. *rubelliana.*
 ε. *Mala curtipendula dicta.* *Baub. hist.* 1. p. 21. *cestiana.*
 Epirotica. ζ. *Poma orbiculata.* *Ruell. stirp.*
Habitat in Europa. 5

Fig. 1. Linnaeus's entry for *Pyrus malus*.

Pyrus malus L., Sp. Pl.: 479, 1200 (1753) = **Malus pumila** Mill., Gard. Dict. Ed. 8: Malus n. 3 (1768), (unidentified cv.)

Type: Cultivated in Europe, Herb. Linn. 647.3 (LINN, fiche seen; lecto selected by Ghora & Panigrahi, Fam. Rosaceae in India 2: 375, t. 72A (1995)).

Malus pumila is the earliest specific name in *Malus* for any plant, wild or cultivated, derived from the variable wild apple populations of Central Asia. See below.

Some, at least, of the varieties Linnaeus recognised seem to represent what might be thought of today as cultivar groups, now 'typified' by particular cultivars:

Pyrus malus L. var. *cavillea* L., Sp. Pl. ed. 2, 1: 686 (1762) = **Malus pumila** Mill. 'Calville Rouge d'Automne'

cavillea, ζ. Mala fativa, fructu magno intense rubente, viola
odore. *Tournef. inf.* 635.

Fig. 2. Linnaeus's entry for *Pyrus malus* var. *cavillea*.

Type: Cultivated at National Fruit Collection [Accession 1949011 – ex *W. Barnes*, Bexhill, England, Oct. 1949], Brogdale, Faversham, Kent, England, 20 May 1999, *E.-J. Lamont* 1309 p.p.(fl.), (neo, designated here: NSW; isoneo: BM, FHO; epitype [same tree, lvs, 5 Aug. 1999, *E.-J. Lamont* 1309 p.p]: NSW; iso-epi: BM, FHO).

There is no extant original material; none survives in any of Linnaeus's herbaria, and although Linnaeus cited a Tournefort binomial, it cannot be linked to anything other than a generalised illustration describing a number of different taxa. He did not study Tournefort's specimens (in any case no material of this taxon survives in Tournefort's herbarium at P). Poiret (1804) noted, "On distingue le *calvil d'automne* & le *calvil blanc* ou *calvil d'été* ", grouping them under 'Le Calvil' with Linnaeus's and Tournefort's names as synonyms.

Although it was being grown in at least South Australia around 1916, this apple is apparently no longer in Australia, though other 'Calville' cultivars are still found here (Clive Winmill, pers. comm.).

Pyrus malus L. var. *cestiana* L., Sp. Pl. 1: 479 (1753) = **Malus pumila** Mill. 'Court-Pendu Plat'

Type: Cultivated, from material grown in Badger's Keep Nursery, Chewton, Victoria, Australia, 31 Mar. 1999, fr. [dried and in spirit], *D.J. Mabberley*, *K. Robertson* & *C. Winmill* 2474 (neo designated here: NSW; isoneo: BM, FHO, L, MEL).

There is no extant original material in any of the Linnaean herbaria. Linnaeus cited Bauhin & Cherler (1650: 21) but that is not accompanied by an illustration, nor can any supporting material be found at UPS, or at BAS (Heinz Schneider, pers. comm.). A neotype has therefore been designated. This apple has been known in cultivation for some 400 years.

Pyrus malus L. var. *epirotica* L., Sp. Pl. 1: 480 (1753) = **Malus pumila** Mill. 'Pomme d'Api'

Type [icon]: 'Pomme d'Api' — R. Hogg, *Herefordshire Pomona* t. 74, f. 2 (1876-85) (neotype selected here).

There is no extant original material in any of the Linnaean herbaria. The name is based on a description (without any illustration) of *Poma orbiculata* by Dioscorides (1552). Poiret (l.c.) added the Tournefort synonym *Malus sativa, fructu orbiculata, odorato ... Pomme Rose* and referred the plant to his 'La pomme-rose', noting 'Cette pomme est toute ronde, d'une couleur de rose assez jolie, d'une faveur parfumée'. 'Le gros api, pomme rose' was listed by Audibert Frères (1825) in their catalogue and considered a form of the 'Pomme d'Api' by Decaisne & Naudin (n.d.: 433, t. 168). Selection of the 'Pomme d'Api' was attributed to the Greeks with Claudius Appius saying it came from the Peloponnese (Société National d'Horticulture de France, Section Pomologique [1907: 454]).

Although grown in Australia up to World War I, as the Lady Apple, it is apparently no longer in cultivation here, though allegedly represented at Brogdale, England (Clive Winmill, pers. comm.) but we have seen no European material, hence our choosing to designate an (excellent) illustration as neotype.

Pyrus malus L. var. *paradisiaca* L., Sp. Pl. 1: 479 (1753) = **Malus pumila** Mill. 'Malling VIII' ('M8').

Type: Cultivated ('*Malus* M8 rootstock'), Horticultural Research International East Malling, Kent, England, 25 April 2000, fl., *A. King s.n* (neo designated here: NSW; isoneo: BM, FHO).

There is no extant original material in any of the Linnaean herbaria. The name is based on a polynomial from Bauhin (1623), but there are no specimens in the Burser Herbarium (UPS) associated with it. Bauhin in turn cited Bock who referred to it as 'Paradisian, in German Paradeisopffel'. Worlidge (1676: 159) wrote, 'The Paradise Apple is a curious Fruit, produced by grafting a Permain [sic] on a Quince'. It is difficult to be sure whether early authors were using the name for the grafted plant as a whole or as it was later used as the common name applied worldwide to some grafting stocks. The epithet 'Paradise' is associated with things Persian, the word being derived from the Old Persian *pairi daiza* meaning a walled garden, suggesting an origin for the plant, many authors considering it introduced to Britain from Armenia via France.

Linnaeus himself may not have had any particular selection of dwarfing stock in mind and there was great confusion about the stocks in any case (Hatton 1917). According to Carrière (1879), there were three sorts of grafting stocks in use on the Continent of Europe in the nineteenth century — *franc*, *doucin* and *paradis*, of which the latter two were propagated by cuttings; Carrière added that the old 'Paradis ordinaire' (Malling VIII, though Malling IV was common in Holland and Germany), which was not reliable under all conditions, was in his time being replaced by the 'Paradis jaune (de Metz)', i.e. Malling IX ('M9') (Hatton 1917). The latter, which was selected by the firm of Simon-Louis at Plantières-les-Metz in 1828, is the common stock now used in Australia. Malling VIII has probably never been grown here and we have found no herbarium material of it from any country, so we have had specimens from the East Malling stock prepared to serve as neotype.

Pyrus malus L. var. *prasomila* L., Sp. Pl.: 479 (1753) = **Malus pumila** Mill. 'Reinette Franche'

Type: Cultivated at National Fruit Collection, Brogdale, Faversham, Kent, England [Accession 1947288 ex *A. Viennois*, Odenas, Rhone, France, Mar. 1947], 20 May 1999 (fls), *E.-J. Lamont 1308 p.p.* (neo designated here: NSW; isoneo: BM, FHO); epitype [same tree, 5 Aug. 1999 (lvs), *E.-J. Lamont 1308 p.p.*]: NSW; iso-epi: BM, FHO).

There is no extant original material in any of the Linnaean herbaria. The name is based on a polynomial from Bauhin (1623) but there are no associated specimens in the Burser Herbarium (UPS). The Bauhin reference is to the 'Granicher' apple. Known from before 1650, it is Tournefort's *Malus sativa*, *fructu subrotundo, è viridi pallescente, acido-dulci* and *Renette blanche, ou franche* (Tournefort 1700: 634), referred to 'Renette Blanche' (white or French Renette) by Miller (1768). Linnaeus himself annotated his own copy (in LINN) of *Species plantarum* with 'Renette' after 'Bauh. pin. 433'. Desfontaines (1809: 140) had var. *prasomila* for the 'reINETTE' and Poiret (l.c.) refers both Tournefort's and Linnaeus's names to his 'La reINETTE', adding, 'C'est la plus estimée de toutes: on en distingue de plusieurs sortes: la *reINETTE blanche* ... la *reINETTE grise* ... la *reINETTE franche*'. According to the Société Nationale d'Horticulture de France, Section Pomologique (1907: 510), 'ReINETTE commune' and 'ReINETTE blanche' are synonyms of 'ReINETTE Franche'.

Although several 'ReINETTES' are grown in Australia, 'ReINETTE Franche' seems never to have been grown here, though it is still in England, e.g. at Brogdale, where the neotype material was gathered.

***Pyrus malus* L. var. *rubelliana* L., l.c. = *Malus pumila* Mill. cv.**

There is no extant original material in any of the Linnaean herbaria. The name is based on a polynomial from Tournefort (1700: 635), who, in turn cited *Poma rubelliana* of Dioscorides (1552: 252), which is the source of Linnaeus's epithet. Tournefort called such trees 'Pommes de Rouveau', 'rouveau' probably being an archaic French word for reddish (Aymonin, P, pers. comm.), cognate with Ruellius's name for Dioscorides' plant which Tournefort cites. Linnaeus took up very few of the horde of apple cultivars discussed by Tournefort, so this one must have seemed distinctive to him, though perhaps he was using the name to cover the pearmain of the time in general (see above). Poiret, l.c., referred both the Linnaean and Tournefortian names to his 'Le rouveau', and included the illustration 'Zahmer [= domestic] Apfel baum' of Blackwell (1750-52: t. 141), which was apparently of one of the standard pearmain of the period, and was referred here at least as early as the 1770s (Reichard [1779: 502], who wrote, 'Ce fruit est d'un rouge sanguin, assez agréable par sa saveur douce, aigrelette'). It is not discussed by Desfontaines (l.c.), and 'rouveau' does not appear in the French catalogues we have examined or in modern dictionaries. Perhaps the original 'Greek' plant of Dioscorides is long lost.

***Pyrus malus* L. var. *sylvestris* L., Sp. Pl.: 479 (1753) = *Malus sylvestris* (L.) Mill.**

Type: Latvia, 'Dist. Madonensis, prope villula Grasi', V. Langenfelds 105 (neo-: RIG, photo seen; selected by Langenfelds, Apple-trees: 186, 1991).

Desfontaines (l.c.) had *Malus communis* var. *sylvestris* for the 'sauvageon' but Moench (1794: 680) used *M. sylvestris* for *Pyrus malus* and Poiret (op. cit.: 560) included '*M. sylvestris* Bauh.' under *M. communis*. Indeed, in advance of the latest findings the recent problem over not using *M. communis* or *M. domestica* for the orchard apple largely stemmed from the interpretation of *P. malus* var. *sylvestris* L. Without a Greek letter in the protologue, var. *sylvestris* might appear to be referring to the 'typical' (autonymic) variety and might therefore be a superfluous name for var. *malus* (Kartesz & Gandhi 1992). However, Dick Brummitt (K, pers. comm.), wrote, "my feeling is that [Linnaeus] had no concept of autonyms, and that any infraspecific epithet he published should be accepted as a validly published varietal name. I know that it is odd that he did not publish the alpha sign, but if he had done so I would feel that '*sylvestris*' is still an atypical variety, and when he left out the sign I am not inclined to think that the epithet should be treated any differently ... Then I would be inclined to treat Miller's specific name as a new one".

Dan Nicolson (US, pers. comm.) suggested, "Linnaeus did not view species as being composed of nothing but varieties alpha onward but what we would call "typical" he did not number. To this element he attached what he numbered (in Greek) what we call varieties that he sometimes named. I do not know why he did not number the alpha attachment but it, like the beta, gamma, delta, etc. varieties are not "typical" in the modern sense ... I note that *Pyrus Malus*, surely the cultivated taxon, would not have been called "*sylvestris*" (the forest or wild apple). By the same token, the preceding species involving the cultivated pear, *Pyrus communis*, surely should not be typified on an element Bauhin called *Pyrus sylvestris* and Linnaeus called [var.] *pyraster* (false pear)".

We agree: in this interpretation, var. *sylvestris* is therefore not a superfluous renaming of the 'typical' variety and can continue to be used for the native apple of Europe - as *Malus sylvestris* (L.) Mill. If the contrary view is taken, *M. sylvestris* Mill. is a new name for *Pyrus malus* L., i.e. it would be a contender for the name for the cultivated orchard apple, as used long ago by, e.g. Moench (1794), though perhaps he was then referring to apples in the wild that were derived from orchard apples. In this case, the European plant would have to bear a different name: this is not in the interests of nomenclatural stability. The synonymy for the native European tree is therefore:

Malus sylvestris (L.) Mill., Gard. Dict. Ed. 8: Malus n. 1 (1768).

Type: see above.

≡ *Pyrus malus* L. var. *sylvestris* L., Sp. Pl.: 479 (1753).

≡ *M. communis* Desf. var. *sylvestris* (L.) Desf., Hist. Arb. 2: 140 (1809), nom. illeg.

Europe to C Asia. This is a rare and rather invariable species armed with spines.

The name of orchard apples

In publishing *Malus pumila*, Miller (1768) cited as a synonym *M. pumila quae potius frutex quam arbor* Bauhin (1623: 433) and referred to the his plant as "Paradise Apple". This synonym is shared with *Pyrus malus* var. *paradisiaca* L. Although Miller did not explicitly cite Linnaeus's name, he "applied Linnaeus's method entirely" in the eighth edition of *The gardeners dictionary* (Miller 1768). Under the ICBN (Greuter et al., 2000), Arts 32. 1(c), 32. 3, 32. 4 and 32 Ex. 7, in citing the Bauhin polynomial and linking it to the Paradise Apple, Miller provided an indirect but clear reference to *P. malus* var. *paradisiaca*. We therefore accept *M. pumila* as a *nomen novum* for *P. malus* var. *paradisiaca*, with which it is therefore homotypic. *Malus pumila* is, in consequence, the correct binomial, in *Malus*, for the orchard apple and its wild antecedents. Commonly used names and the Linnaean names discussed above are included in the synonymy below (* = additions to *Index Kewensis* and other lists):

Malus pumila Mill., Gard. Dict. ed. 8: Malus n. 3 (1768); Rehder, Bibl. Cult. Trees Shrubs: 267 (1949).

Type: as for *Pyrus malus* var. *paradisiaca* (see above).

≡ *P. malus* L. var. *paradisiaca* L., Sp. Pl.: 479 (1753).

≡ *M. paradisiaca* (L.) Medik., Gesch. Bot.: 78 (1793), nom. superfl.

≡ *M. communis* Desf. var. *paradisiaca* (L.) Desf., Hist. Arb. 2: 140 (1809), nom. illeg.

≡ *P. pumila* (Mill.) Mill. ex Steud., Nomencl. Bot.: 670 (1821).

[≡ *P. paradisiaca* (L.) Steud., l.c., nom. in synon.]

≡ *M. paradisiaca* (L.) Medik. var. *pumila* (Mill.) Koehne, Deut. Dendr.: 259 (1893), nom. illeg.

≡ *M. pumila* Mill. var. *paradisiaca* (L.) C.K. Schneid., Ill. Handb. Laubh. 1: 715 (1906).

≡ *P. malus* L. var. *pumila* (Mill.) A. Henry in Henry & Elwes, *Trees Brit. Irel.* 6: 1570 (1912), nom. superfl. pro *P. malus* var. *paradisiaca*

≡ *M. sylvestris* (L.) Mill. var. *paradisiaca* (L.) L.H. Bailey, *Hortus Sec.*: 457 (1941).

≡ *M. sylvestris* (L.) Mill. subsp. *paradisiaca* (L.) Soó, *Acta Bot. Acad. Sci. Hung.* 18: 175 (1973).

≡ *M. praecox* (Pall.) Borkh. var. *paradisiaca* (L.) Valev, *Fl. Reip. Pop. Bulg.* 5: 347 (1973).

≡ *M. domestica* Borkh. var. *paradisiaca* (L.) Lich., *Trudy Prikl. Bot. Genet. Selekt.* 52(3): 21 (1974), nom. illeg.

≡ *M. domestica* Borkh. subsp. *pumila* (Mill.) Likh., *Fl. Kul't. SSSR* 14: 69 (1983), nom. illeg.

= *P. malus* L., *Sp. Pl.* 1: 479, 2: 1200 (1753).

Type: see above.

≡ *Sorbus malus* (L.) Crantz, *Stirp. Austr. Fasc.* 2: 57 (1763).

≡ *M. sylvestris* Moench, *Meth.*: 680 (1794); Karstesz & Gandhi, *Phytol.* 73: 131 (1992); non (L.) Mill. (1768).

≡ *M.* communis* Desf., *Fl. Atlantica* 1: 398 (1798).

≡ *M. domestica* Borkh., *Theor-Prakt. Handb. Forstbot.* 2: 1271 (1803), nom. illeg., superfl.; Korban & Skirvin, *HortSci.* 19: 177 (1984).

≡ *Pyrenia malus* (L.) [Clairv.], *Man. Herb. Suisse*: 162 (1811).

≡ *Pyrus sylvestris* Gray, *Nat. Arr. Brit. Pl.*: 2: 562 (1821), nom. superfl.

≡ *M. pumila* Mill. var. *domestica* (Borkh.) C.K. Schneid., *Ill. Handb. Laubh.* 1: 715, t. 396 (1906).

≡ *P. pumila* (Mill.) Steud. var. *domestica* (Borkh.) Asch. & Graebner, *Syn. Mitt. Fl.* 6, 2: 77 (1906).

≡ *M. dasyphylla* Borkh. var. *domestica* (Borkh.) Koidz., *Acta Phyt. Geob.* 3: 189 (1934).

Note. Of the names in *Malus* based on *Pyrus malus* L., and therefore on its type specimen, the earliest (but see *P. malus* var. *sylvestris* above) are *M. communis* Desf. (1798) and *M. domestica* Borkh. (1803). *Malus communis*, despite being published in a major Flora, has been overlooked (it is not listed in *Index Kewensis* for example) and *M. domestica* was long considered to be a species of *Sorbus* (see, e.g. , *Index Kewensis*). The latter, a superfluous name, has only relatively recently been resuscitated, though Borkhausen (1803) implied it was in use, if not in print, before 1803. Although earlier he (Borkhausen 1797) had followed Medikus (1793) in splitting off *Malus* from *Pyrus*, he himself certainly did not use *M. domestica* then. *Index Londinensis* lists *Malus communis* as published in 1797, though the cited plate actually appeared in 1794, but its accompanying letterpress with the name *M. communis* was not published in the work cited until 1819.

= *Pyrus malus* L. var. *cestiana* L., *Sp. Pl.*: 479 (1753).

Type: see above.

= *Pyrus malus* L. var. *epirotica* L., *Sp. Pl.*: 480 (1753).

Type: see above.

[≡ *P. epirotica* (L.) Steud., l.c., nom. in synonym.]

= *Pyrus malus* L. var. *prasomila* L., *Sp. Pl.*: 479 (1753).

Type: see above.

≡ *Malus communis* Desf. var. *prasomila* (L.) Desf., l.c.

≡ *P. parasomila* Steud., op. cit: 671 (1821).

≡ *P. prasomila* (L.) Steud., l.c.

≡ *M.* prasomila* (L.) Poit. & Turpin in Duhamel, *Traité nouv. éd.* 5: t. 111 (1810 'prosomila').

= *Pyrus malus* L. var. *rubelliana* L., Sp. Pl.: 479 (1753).

Type: see above.

= *Pyrus malus* L. var. *cavillea* L., Sp. Pl. ed. 2, 1: 686 (1762).

Type: see above.

≡ *Malus communis* Desf. var. *cavillea* (L.) Desf., l.c.

[≡ *P. cavillea* (L.) Steud., Nomencl. Bot.: 670 (1821), nom. in synonym.]

≡ *M. domestica* Borkh. var. *cavillea* (L.) Likh., Fl. Kul't SSSR 14: 65 (1983).

= [? *Malus vulgaris* Pallas, Reise 3: 653 (1776), nom. nud.]

= *Pyrus sieversii* Ledeb., Fl. Alt. 2: 222 (1830).

Type: 'Siberia', [1790-4], J.E. Sievers s.n. (LE?, n.v.).

≡ *Malus sieversii* (Ledeb.) M. Roem., Syn. 3: 216 (1847).

Native in Central Asia, *M. pumila* is now much restricted in the wild, but selected forms have been carried throughout the temperate world as orchard apples and become naturalised widely. Wildings in Europe include trees named in Floras *M. acerba* Mérat, for example.

It was the habit of early European voyagers to Australia to plant seeds of European crops, so that apple seeds may well have been sown before the First Fleet arrived in 1788. Cultivars growing in England about the time of the Fleet are listed in Weston (1775: 220), but others introduced to Australia then or before could have been picked up at ports of call on the voyages from Europe. Those apples likely to have been brought by the Fleet (Surrey Jacobs, NSW, pers. comm.) include *M. pumila* 'Court-Pendu Plat' (see above), still grown, and 'French Crab', from which arose 'Granny Smith'.

Conclusion

The foregoing demonstrates how intricate ascertaining the correct nomenclature for economic plants can be. In recent years there has been much ink spilled in ascertaining the correct name in *Lycopersicon* (Solanaceae) for the common tomato, *L. esculentum* Mill. (see Terrell et al., 1983), but all that has now been superseded in that the tomato has been returned to where Linnaeus had it — in *Solanum*, so that it is now *S. lycopersicum* L. once more (Spooner et al., 1993). Similarly, although *Malus pumila* is now, once again, seen to be the correct name in *Malus* for the common apple, it is likely that the narrowly defined genera of this group coming from folk taxonomy (Walters 1961), will also ultimately be recombined following phylogenetic work. In this case, the folk taxonomy was enshrined, for example, by Tournefort (as in citrus fruit [Mabberley 1997b] and the strawberry and its allies: *Potentilla* to include *Fragaria*), then rejected by Linnaeus, and later resurrected by Miller, Medikus and Jussieu.

In following the re-amalgamation of the other Rosaceous genera *Amygdalus* L., *Armeniaca* Scop., *Cerasus* Mill., *Laurocerasus* Duham., *Padus* Mill. and *Persica* Mill., into *Prunus* L., so that the name of the almond is once more referred to *Prunus*, as *P. dulcis* (Mill.) D.A. Webb, and that of the peach becomes *P. persica* L. once more, the name of the apple would then revert to just what Linnaeus (and most early C20 authors including Church) had — *Pyrus malus* L., or even *Sorbus malus* (L.) Crantz, with concomitant changes in the names of other species presently accommodated in *Malus*.

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References

- Audibert Frères (1825) *Catalogue des arbres, arbrisseaux, arbustes, et plantes, cultivés dans les pépinières et serres des Frères Audibert*. (Huzard: Paris).
- Bauhin, C. (1623) *Prodromus theatri botanici* (Basileae).
- Bauhin, J. & Cherler, J.H. (1650) *Historia plantarum universalis*, vol. 1. (Ebroduni).
- Blackwell, E. (1747-1773) *Herbarium blackwellianum*. (Nürnberg).
- Bock, H. (1552) *De stirpium... commentariorum libri tres*. (Argentorati).
- Borkhausen, M.B. (1797) Ueber die linneischen Gattungen *Crataegus, Mespilus, Sorbus, Pyrus* und *Cydonia*. *Arch. Bot.* 1(2): 85–91.
- Borkhausen, M.B. (1803) *Theoretisch-praktisches Handbuch der Forstbotanik und Forsttechnologie*, vol. 2. (G.F. Heyer: Darmsdtadt).
- Browicz, K. (1972) *Malus* Miller in P.H. Davis (ed.) *Flora of Turkey and the East Aegean Islands*, vol. 4: 157–159. (Edinburgh University Press: Edinburgh).
- Browning, F. (1998) *Apples*. (North Point Press: New York).
- Carrière, E.-A. (1879) Un nouveau sujet pour greffer les pommiers. *Rev. Hort.* 54: 436–7.
- Corner, E.J.H. (1946) Suggestions for botanical progress. *New Phytol.* 45: 185–192.
- Decaisne, J. & Naudin, C. (n.d.) *Manuel de l'amateur des jardins*, vol. 4. (Didot: Paris).
- Desfontaines, R.L. (1809) *Histoire des arbres et arbrisseaux*, vol. 2. (J.A. Brosson: Paris).
- Dioscorides (1552) *Anazarbei de medicinali materia libri quinque*. (Lugduni).
- Ghosh, C & Panigrahi, G. (1995) *The family Rosaceae in India*, vol. 2. (Bishen Singh Mahendra Pal Singh: Dehra Dun).
- Given, D.R. & Sykes, W.R. (1988) *Malus*. Pp. 1084 - 1086 in C.J. Webb, W.R. Sykes & P.J. Garnock-Jones (eds) *Flora of New Zealand*, vol. 4 (D.S.I.R.: Christchurch).
- Greuter, W., McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Filgueiras, T.S., Nicolson, D.H., Silva, P.C., Skog, J.E., Treharne, P., Turland, N.J. & Hawksworth, D.L. (eds) (2000) International Code of Botanical Nomenclature (Saint Louis Code). *Regnum Vegetabile* 138. (Koeltz: Königstein).
- Harden, G.J. & Rodd, A.N. (1990) *Malus* in G.J. Harden (ed.) *Flora of New South Wales*, vol. 1. (New South Wales University Press: Kensington).
- Hatton, R.G. (1917) Paradise apple stocks. *J. Roy. Hort. Soc.* 42: 361–399.
- Kartesz, J.T. & Gandhi, K.N. (1992) Nomenclatural notes for the North American Flora. XI. *Phytologia* 73: 124–136.
- Korban, S.S. & Skirvin R.M. (1984) Nomenclature of the cultivated apple. *HortScience* 19: 177–180.
- Mabberley, D.J. (1987) *The Plant-book*. (Cambridge University Press: Cambridge).
- Mabberley, D.J. (1997a) *The Plant-book*, edn 2. (Cambridge University Press: Cambridge).
- Mabberley, D.J. (1997b) A classification for edible *Citrus* (Rutaceae). *Telopea* 7: 167–172.
- Mabberley, D.J. (2000) *Arthur Harry Church: the anatomy of flowers*. (Merrell & The Natural History Museum: London).
- Mansfeld, R. (1986) *Verzeichnis landwirtschaftlicher und gärtnerischer Kulturpflanzen (ohne Zierpflanzen)*, vol. 1. (Springer: Berlin etc.).

- Maxwell, H.S., Knees, S.G. & Gardner, M.F. (1988). *Malus*. Pp. 408–12 in J. Cullen & al. (eds) *The European garden flora*, vol. 4. (Cambridge University Press: Cambridge).
- Medikus, F.C. (1793) *Geschichte der Botanik unserer Zeiten*. (Mannheim).
- Miller, P. (1768) *The gardeners dictionary*, edn 8. (London).
- Moench, C. (1794) *Methodus plantas horti botanici et agri marburgensis*. (Marburg).
- Poiret, J.L.M. (1804) in J.B.A.P.M. de Lamarck, *Encyclopédie méthodique. Botanique*, vol. 5. (Panckoucke: Paris).
- Rehder, A. (1949) A bibliography of cultivated trees and shrubs hardy in the cooler temperate regions of the northern hemisphere. (Arnold Arboretum: Massachusetts).
- Reichard, J.J. (1779) *Systema naturae plantarum*, vol. 2 (Francofurti ad Moenum).
- Robinson, J.P., Harris, S.A. & Juniper, B.E. (2001). Taxonomy of the genus *Malus* Mill. (Rosaceae) with emphasis on the cultivated apple. *Plant Syst. Evol.* 226: 35–58.
- Rumsey, H.J. (1924) Granny Smith. *Farmer and Settler and Livestock Breeder's Journal* 19(22): 13.
- Société National d'Horticulture de France, Section Pomologique (1907) *Les meilleurs Fruits au Début du Xxe Siècle*. Paris.
- Spooner, D.M., Anderson, G.J. & Jansen, R.K. (1993) Chloroplast DNA evidence for the interrelationships of tomatoes, potatoes and pepinos (Solanaceae). *Amer. J. Bot.* 80: 676–688.
- Spurway, J. (n.d.) Granny Smith and her apple. [Ryde] *Library & Information Services Local Studies Leaflet Series no. 2*.
- Symon, D.E. (1986) *Malus*. Pp. 439–40 in J.P. Jessop & H.R. Toelken (eds) *Flora of South Australia*, edn 4, vol. 1 (South Australian Government Printing Division: Adelaide).
- Terpó, A. (1988) *Malus*. Pp. 66–7 in T.G. Tutin & al. (eds) *Flora europaea*, vol. 2. (Cambridge University Press: Cambridge).
- Terrell, E.E., Broome, C.R. & Reveal, J.L. (1983) Proposal to conserve the name of the tomato as *Lycopersicon esculentum* P. Miller and reject the combination *Lycopersicon lycopersicum* (L.) Karsten (Solanaceae). *Taxon* 32: 310–314.
- Tournefort, J.P. (1700) *Institutiones rei herbariae*, vol. 1 (Typographia Regia: Paris).
- Tucker & Co. [1938] *Milestones*. (Tucker & Co. Pty. Ltd.: Sydney).
- Vaughan, J.G. & Geissler, C. (1997) *The new Oxford book of food plants*. (Oxford University Press: Oxford).
- Walters, S.M. (1961) The shaping of angiosperm taxonomy. *New Phytologist* 60: 74–84.
- Weston, R. (1775) *Flora anglicana*. (London).
- Worldige, J. (1676) *Vinetum britannicum; or a treatise of cider*. (London).
- Zohary, D. & Hopf, M. (1988) *Domestication of plants in the Old World*. (Clarendon Press: Oxford).
- Zohary, D. & Hopf, M. (1994) *Domestication of plants in the Old World*, edn 2. (Clarendon Press: Oxford).

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