



United States  
Department of  
Agriculture

Agricultural  
Research  
Service

Northeastern Region  
Beltsville Agricultural  
Research Center

Beltsville, Maryland  
20705

August 19, 1983

SUBJECT: Summary of Problem About Name for Apple

TO: R. Spjut

You already copied much literature on the problem of the correct name for the apple. There is a big folder in the file.

I would appreciate your writing a summary of the nomenclatural and taxonomic facts regarding this problem. I have in mind a chronological summary starting with Linnaeus or Miller or earlier, if necessary. The purpose would be to provide the salient facts regarding the nomenclatural history, together with conclusions. Not knowing anything about the facts of the problem, I would suppose such a summary would run at least 2 pages but no more than several pages.

As you know, I have a copy of a manuscript about this, but I would prefer you not consult this - just give your own interpretation - and we can consult the manuscript later.

A handwritten signature in cursive script, appearing to read "Ed" or "E. E.", written in dark ink.

E. E. TERRELL

R. Spjut



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September 14, 1983

SUBJECT: Nomenclatural Dilemma for the Cultivated Apple

TO: E. E. Terrell

### Pyrus vs. Malus

The decision as to whether apples belong to the genus Pyrus or Malus is a taxonomic one. In pre-Linnaean literature the apple was commonly regarded as Malus (Caspar Bauhin 1623, Dodoens, 1583; Tournefort, 1700). Linnaeus, in combining genera, had a practice of retaining old generic names (Stearn, 1957); thus, when he combined the apples with the pears as in his Species Plantarum (1753), the apple became Pyrus malus. Other followers of Linnaeus include: Wallroth (1822), DeCandolle (1825), Focke (1894), Ascherson & Graebner (1910) and Gleason (1952). Pyrus malus L. is still an acceptable name for the apple (e.g., Robertson, 1974).

Taxonomic differences between Malus and Pyrus can be found in Bailey (1949) and Robertson (1974). Bailey is of particular interest because before 1941 he had considered Malus and Pyrus as one genus. In his summary of the "Pyrus-Malus puzzle," he explains why he changed his mind. "It is not a question of a modus operandi. Nurserymen sense the differences between Pyrus species and Malus species." "I have also studied all the 1128 sheets of these two genera in the Hortorium herbarium covering the range of the genus. I find that whether specimens of foliage, inflorescence, fruits are fresh or dried and whether plants are named or not named, I can always distinguish Pyrus and Malus."

Most taxonomists separate Malus from Pyrus. In accordance with the International Code of Botanical Nomenclature (ICBN), Malus originates with Phillip Miller's 4th edition of The Gardener's Dictionary (1754). Linnaeus (1753) recognized 2 species of apples (in Pyrus) and Miller (1768) 3 species (in Malus). Since these publications, many more have been described. About 30 are currently recognized with a well-marked center of diversity in Central Asia.

### History of Nomenclature in Malus

Miller (1768) described Malus sylvestris ("Wild Apple With a Very Sour Fruit, Commonly Called Crab"), Malus coronaria ("Wild Crab of Virginia, With a Sweet-Scented Flower") and Malus pumila ("Dwarf Apple, Which is Rather a Shrub Than a Tree, Commonly Called Paradise Apple").

Before 1753, it appears that Linnaeus may have differentiated the wild apple, "Pyrus sylvestris" from the cultivated apple (Pyrus malus L.) in Olandska och Gothlandska Resa (1745). In Species Plantarum (1753), the 'varietal' epithet for P. malus sylvestris is in bold type but lacks the Greek sign he often used to mark his varieties, as he did so for other 'varieties' listed

under Pyrus malus. Therefore, Linnaeus (1753) may have reduced Malus sylvestris to a wild form of the domesticated apple. Miller (1768) also implied synonymy of the wild apple (M. sylvestris) with the domesticated one when he stated "I have not distinguished the apples from the Crab as a distinct species."

Borkhausen (1803) was the first to clearly distinguish the domesticated apple ("Zahmer Upfel," Malus domestica) from the wild apple (M. sylvestris) and from the dwarf or paradise apple (M. pumila cited under M. praecox).

Poiret (1804) included all of the Linnaean references (1753), and more, under his Malus communis; thus Malus communis Poiret (1804) is equivalent to Pyrus malus L. (1753). However, Poiret (1804) failed to make reference to M. sylvestris P. Mill. (1768), M. pumila P. Mill. (1768) or M. domestica Borkh. (1803) and since both Borkhausen and Miller's names precede Poiret, M. communis Poiret (1804) must be rejected.

How Malus pumila P. Mill. (1768) became associated with the common apple is not clear. Roemer (1847) listed numerous horticultural names under Malus acerba (= M. sylvestris) and M. paradisiaca (= M. pumila); thus, the garden apple here is associated with two species. Koch (1869), as he stated, intentionally substituted Pyrus pumila for Pyrus malus because evidently he felt Pyrus malus L. (1753) was an ambiguous name. Koch (1869) also referred to the paradise apple (M. pumila) as the apple from heaven that was first eaten by man in Paradise. Focke (1869) concluded that of all the wild forms, P. pumila best characterizes the origin of the apple. This may have influenced Schneider (1906) who reduced M. domestica, M. praecox and M. paradisiaca to varieties of M. pumila but kept M. sylvestris separate. Schneider's (1906) systematic format has been repeated, with minor variations, by Ascherson & Graebner (1910), Bailey (1925) and Rehder (1940).

Since Miller (1768) did not establish clearly the taxonomic relationship between the garden apple and the wild apple (M. sylvestris), he left this open for others. Malus sylvestris P. Mill., M. domestica Borkh. and M. pumila P. Mill. are all acceptable names for the apple. Additionally, Koidzumi (1934) suggested M. dasyphylla Borkh. as the wild ancestor of the domesticated apple and reduced M. domestica to a variety of M. dasyphylla; thus, adding another choice to the list of scientific names for the apple.

The correct scientific name of the apple is basically a taxonomic judgment except that this is also tied up with another problem - the type species for the genus Malus. Britton and Brown (1913) indicated the type for the genus Malus as Pyrus malus L. (1753), but in their transfer of Pyrus malus L., they created a tautonym (Malus malus is illegitimate, Art. 23.4 of the ICBN). Britton and Brown (1913); however, cited Malus sylvestris P. Mill. as a synonym of Malus malus. The ING (1979) refers to Britton and Brown (1913) and gives Malus sylvestris P. Mill. as the lectotype species for the genus Malus. On the other hand, the ICBN (1978) under Art. 55(4) states "Pyrus malus L. (1753) when transferred to the genus Malus must be called Malus pumila Mill., the combination Malus malus (L.) Britton (1913) being inadmissible." The ICBN probably should drop this example from the code as there is no evidence to exclusively support Malus pumila as the name of choice.

If the type for the genus Malus is the familiar garden apple, based on Pyrus malus L. (1753), and assuming that a type is not available for M. sylvestris P. Mill. (1768), then the correct name for the garden apple would seem to be Malus sylvestris P. Mill. (based on ING). On the other hand, two theoretical different types cannot be used for the type species (Malus sylvestris and Pyrus malus) of a genus (Malus). Miller's description for Malus sylvestris (1768) refers clearly to a wild (crab) apple and if a type does exist then the correct name for the garden apple could be any of the names aforementioned. The type for Pyrus malus L. (1753) is probably the cultivated apple since Linnaeus usually picked the most commonly known element to represent his species concept. This is also evident by the fact that Linnaeus cited P. Malus sylvestris immediately following Pyrus malus without a clear varietal designation, that the epithet sylvestris, meaning woodland, refers to the wild, and that malus was commonly used in reference to the apple in pre-Linnaean literature and consequently Linnaeus was making it clear to others when he combined the apple with the pear (Pyrus malus).

Putting the type problem aside, the best choice for the name of the apple is Malus domestica Borkh. This was the first name applied to clearly distinguish the garden apple from other Malus spp., and is clear in its meaning to both the taxonomist and the horticulturist. Malus domestica is the preferred name for the apple in Yuzepchuk (1939), Terpo (1968), Hillier & Sons (1972), Likhonos (1974), and Taylor and MacBryde (1977). Malus pumila might be a good choice because it has been regarded as the origin of the apple (Focke, 1894), a major source of germplasm (Miller, 1768), and perhaps has possible connection to Biblical times through the synonym, M. paradisiaca. Both M. dasyphylla and M. sylvestris have also been regarded as wild ancestors of the garden apple and various systematic treatments center on this; from these M. sylvestris is the more commonly selected name (Browicz, 1972; Mansfeld, 1949, 1959; Terrell, 1977). Many, however, regard the garden apple of hybrid origin (Koch, 1869; Dahl, 1966; Terpo, 1968; Hillier & Sons, 1972; Brown, 1975; Watkins, 1976; Zeven & Zhukovsky, 1975) and in view of this, Malus domestica Borkh. would be the best choice. The use of the 'x' to designate that M. domestica is a hybrid seems inappropriate since the name has been in use for sometime without the 'x' designation. Furthermore, the ICBN under H.3.2 states "an exception may be made for names of amphidiploids and similar polyploids treated as species, which may bear an epithet without the multiplication sign." Malus domestica has become naturalized (Terpo, 1968); and evidently behaves like a good, biological species.

RICHARD SPJUT

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