

KAZIMIERZ BROWICZ

Distribution of woody *Rosaceae* in W. Asia III

Eriolobus trilobatus (Poir.) Roem.

In 1810, on the basis of a herbarium specimen collected by Labillardière in 1787 in Lebanon (Chevalier, 1953), Poiret has described a new species of hawthorn, *Crataegus trilobata* Poir. (Lamarck, 1810). Following a short Latin diagnosis: "*Crataegus foliis lanato-cordatis, trilobatus, serratis; lobis lateralibus bifidis, terminali trifido, pedunculis solitaris*" Poiret gave also a more detailed description of the species in French (particularly of leaves and fruit). A detailed Latin diagnosis and an illustration (a shoot with leaves and fruit) have been made two years later by Labillardière (1812) (fig. 1). However neither Poiret nor Labillardière mention the locality in which *C. trilobata* has been found*. A second time it was found only 70 years later in Lebanon by Kotschy (*in sched.*), who similarly as the two afore mentioned botanists believed that he is dealing with a *Crataegus*.

C. trilobata is a most interesting species, which from the very beginning has caused taxonomists much trouble in the systematisation of it in an appropriate genus, and actually even to-day the question has not been definitely settled yet. Labillardière himself must have had doubts about it, since in his diagnosis he has placed the following remark "...*melius duxi Crataegum quam pyrum dicere fructus foliorumque forma insixus*". Several years after him De Candolle (1825) in his many volumed book "Prodromus" has transferred *C. trilobata* to the genus *Pyrus* and has placed it in a separate section *Eriolobus*, that has been formed by Seringe. This section, according to Seringe is characterized by: "*Petala patentia plana subunguiculata apice subtridentata. Styli 5 elongati utrinque tomentosus coronatum. Folia palmiloba, glabra. Flores corymbosi, pedunculis simplicibus*". In spite of the fact that this view has not been accepted, the name *Pyrus trilobata* (Poir.) DC is mentioned in the literature until 1925 (Mottet).

A further change has been introduced by Heynhold (1814), who considered "*Crataegus trilobata*" as a representative of the genus *Sorbus* and re-

* In the Herbarium Générale, of the Conservatoire et Jardin botaniques in Genève there is a herbarium specimen collected by Labillardière with a label „Tripoli Syrie”; this is the only specimen about which I know that has a localization mentioned by Labillardière.

fers to it as *S. trilobata* (Poir.) Heynhold. This view has been accepted for many years, and even in 1966 in his article discussing new stands in Turkey it has been used by Yaltirik (1966). Within the genus *Sorbus*, Boissier (1872), presumably because of the similarity of fruits between *S. domestica*



Fig. 1. The oldest drawing of *E. trilobatus* made in 1812 (Labillardière — Icones Plantarum Syriae rariorum)

L. and *S. trilobata*, has placed it in the section *Cormus* (Spach) Boiss., while Hedlund (1901) on the basis of leaf shape in *S. torminalis* (L.) Crantz, has moved *S. trilobata* from section *Cormus* to section (group) *Torminaria* Hedl.

Decaisne (1874) has suggested a slight modification to this. He agreed with the view of Boissier but since he considered section *Cormus* as an independent genus he has changed the name *S. trilobata* to *Cormus trilobata* (Poir.) Dene. Decaisne also was aware of the systematic separateness of the species and therefore as De Candolle before him he has established a separate section *Eriolobus* (Ser.) Dene. for it within the genus *Cormus*.

Roemer (1847) in trying to accommodate the conflicting views of Poiret, De Candolle and Heynhold, and stressing the individual characters of "*Cra-*

taegus trilobata" has placed the species in a new monotypic genus *Eriolobus* (Ser.) Roem. His idea was almost completely forgotten and to be exact it was only Rehder who in 1903 returned to it. He has pointed out to the fact that the simple structure of the inflorescence excludes the possibility of treating "*Crataegus trilobata*" within the genus *Sorbus* (*Cormus*) and therefore the view of Roemer appears to be the most justifiable. However Rehder believed that into genus *Eriolobus* three further species could be included, namely: *E. tschonoskii* (Maxim.) Rehd. from Japan (until then considered as *Pyrus tschonoskii* Maxim.), *E. indica* (Wall.) Rehd. and *E. hookeriana* (Dcne.) Rehd. (believed until then to be species of the genus *Docynia* Dcne.) from south-eastern Asia. In this sense the genus *Eriolobus* fits Roemer's only in part, since the species included in this genus by Rehder belong to three different genera: *Eriolobus s. str.*, *Malus* and *Docynia* as is explained below.

In May 1906 Schneider (1906a) has presented a view similar to Rehder's, with the difference that he has split the genus *Eriolobus* into two sections. In the first one — *Eueriolobus* Schneid., in which carpels are 2-seeded, he included 4 species: *E. trilobatus*, *E. kansuensis* (Batal.) Schneid., *E. yunnanensis* (Franch.) Schneid. and *E. tschonoskii*, and in the second section — *Docynia* (Dcne.) Schneid. with carpels 4-5 seeded the remaining species cited by Rehder and *E. delavayi* (Franch.) Schneid. However already half a year later Schneider (1906b) has changed his mind and has critically assessed the separateness of the genus *Eriolobus*. He returned to *Docynia* the old generic status (Decaisne, 1874), and has included section *Eueriolobus* with the genus *Malus*, allocating its species to three different sections: *Malus trilobata* (Poir.) Schneid into section *Eriolobus* (Ser.) Schneid., and *Malus tschonoskii* (Maxim.) Schneid also to a monospecific section *Docyniopsis* Schneid. The two last species, *M. kansuensis* (Batal.) Schneid. and *M. yunnanensis* (Franch.) Schneid. are now placed in the section *Sorbomalus* Zabel.

These taxonomic changes have been later accepted by Rehder (1920) and the name *Malus trilobata* (besides *Sorbus trilobata*) is the most commonly used one, particularly in later works (see for example Terpó, 1968). Similarly as was the case in the systems of De Candolle and Decaisné the section *Eriolobus* also in the genus *Malus* takes up a distinctly isolated position, and its only species as Rehder (1920) writes is „A very distinct species which has no close relation to any other species”.

The second section of Schneider — *Docyniopsis*, which as it were links up section *Eriolobus* with the genus *Docynia*, includes according to Rehder (1920, 1939) 4 species: *M. tschonoskii*, *M. formosana* (Kawak. et Koidz.) Kawak. et Koidz., *M. laosensis* (Card.) Cheval. and *M. melliana* (Hand.-Mazz.) Rehd. According to the last revision of this group made by Vidal (1967) *M. formosana* and *M. laosensis* are identical and the names should be considered as synonyms of a species described earlier as *M. doumeri* (Bois.) Chev. This section *Docyniopsis* is represented presently by three species:

M. tschonoskii from Japan (Honshu), *M. doumeri* from Laos, Viet Nam and Formosa, and *M. melliana* from south and south-eastern China. Thus as can be seen from the above the ranges of the section *Docyniopsis* and genus *Docynia* are well separated geographically from that of *M. trilobata* (fig. 2).

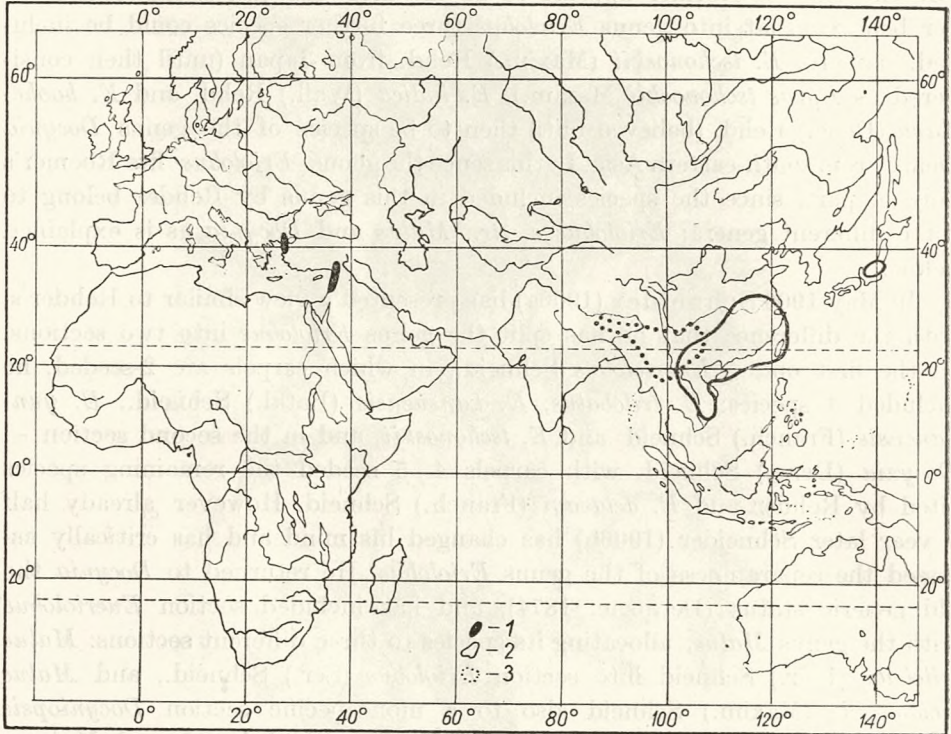


Fig. 2. The range of distribution of *E. trilobatus* and those of closely related groups. 1. *E. trilobatus*, 2. *Malus* Mill. sect. *Docyniopsis* Schneid., 3. *Docynia* Dene. (2 and 3 according to Vidal, 1967, *Adansonia* 6, 4)

In the discussion given here it is noticeable that all the authors mentioned consider the species of Poiret as a very special taxon, for which each time a separate, usually monotypic section has to be provided. In this situation it is hardly surprising that the idea of *Eriolobus* being a separate genus has been resuscitated several times. After Rehder (1903) there came Schneider (1906a). The same view has also been expressed by Stapf (1933) who believed that into the genus *Eriolobus* one further, also puzzling species could be included besides *E. trilobatus*, namely *E. florentinus* (Zuccagni) Stapf., which is most commonly described as *Malus florentina* (Zuccagni) Schneid., in spite of the fact that some consider it as a hybrid between *Sorbus torminalis* and *Malus silvestris*. It grows in Italy, in Yugoslavia, Albania, in Greece and probably also in Asia Minor (Bornmüller, 1940).

Recently Hutchinson (1964) summarizing as it were the discussion

of the question up to now, places the genus *Eriolobus* between *Pyrus* and *Malus*, thereby indicating its affinity. Differences between these three genera are sufficiently small, so that often, even today *Pyrus* and *Malus* are considered as one genus (eg. Meikle, 1966). In contrast to the genus *Pyrus*, genera *Eriolobus* and *Malus* have styles connate at the base while the fruits of *Pyrus* and *Eriolobus* contain numerous grit-celles, and the fruits of *Malus* are devoid of the them or have only very small quantities. Most closely related with *E. trilobatus* are the apple trees of the section *Docyniopsis*, the fruit of which have a diameter of 3 - 5 cm (in *Eriolobus* they are about 2 cm), the inflorescences are composed of 2 - 5 flowers (in *Eriolobus* often up to 10, and usually 6 - 8), and the leaves are generally entire or shallowly lobed (in *Eriolobus* palmately lobed). It appears that in section *Docyniopsis* *Malus doumeri* and *M. melliana* are more close to *E. trilobatus* than the Japanese *M. tschonoskii*, which has sepals shorter than the tube; the first two species are on the other hand characterized by longer sepals than the tube as is the case in *E. trilobatus*. Also it is striking that leaves of young individuals in apple trees from section *Docyniopsis* and the genus *Docynia* are distinctly shallowly lobed, while in older individuals the leaves are entire or almost entire. *E. trilobatus* has always in all its developmental stages distinctly palmately lobed leaves.

As a sort of proof for the need to separate *E. trilobatus* from the genus *Malus* use may be made of the results of phytochemical studies conducted recently by Williams (1966), who has found in apple trees (except the flesh and juice of the mature fruit) the presence of phloridzin which is one of the best known dihydrochalcones. According to Williams (1964) phloridzin "...is the main phenolic compound in the leaf of most of the 25 species of *Malus* listed by Rehder, but in certain species it is wholly or partly replaced by two related dihydrochalcone glucosides". One of them named by Williams (1966) trilobatin occurs only and exclusively in *Malus trilobata*, and the other sieboldin in most species and hybrids of the series *Sieboldianae* Rehd. Thus the presence of trilobatin in *E. trilobatus* differs this species from all other *Malus* species studied so far in this respect, and this includes *Malus tschonoskii*.

E. trilobatus, in spite of the fact that its history has now almost 200 years is still very little known and the existing herbarium materials are still far from sufficient in order to make a detailed analysis of its variability. However already two varieties have been described, the systematic value of which has been questioned by Stapf (1933).

The first variety has been designated in 1862 by Kotschy (*in sched.* no. 52) as *Crataegus trilobata* var. *oxyloba*, and later described by Boissier (1872) as *Sorbus trilobata* (Poir.) Heynhold var. *oxyloba* (Kotschy) Boiss. This is the diagnosis presented by Boissier: "*Foliorum minorum laciniarum angustiores lanceolatae acutissime inde folia saepe 7-palmatipartita*". Stapf (1933) on the basis of the type specimen of Labillardière claims that it is

represented also by "...bluntly and acutely lobed leaves on one branch". In fact comparing the specimens cited below one has to agree with this statement, stressing however that leaves with acute tipped lobes are in *E. trilobatus* most common. It appears that the depth of sinuses between lobes, the width of the lobes and the size of the leaves depend on the character of the shoot (long-shoot or short-shoot) and on its age. Thus maintaining of variety *oxyloba* does not appear to be justifiable. However one could consider the description of a new variety on the basis of Kotschy's specimen (no. 369) from Lebanon. This specimen is characterized by leaves with very wide lobes, blunt tipped, indistinctly serrate even in parts with entire margins (var. *obtusiloba mihi*, nom. eventuale).

A second variety has been described from Europe by Dingler (1883). He has found it in the year 1876 in a blooming condition in north-eastern Greece and has called it *Pyrus trilobata* (Poir.) DC. var. *rumelica* Dingler. A Latin diagnosis of this variety: „*Foliis majoribus subtus tomentellis*” is too general, in order to rely upon it. Dingler does not give accurate dimensions of the leaves, and the pubescence of dorsal side of a leaf is characteristic for young leaves of *E. trilobatus*.

Comparing his herbarium specimen with those from Lebanon, and referring to the note made by Boissier (1872) in his description of *Sorbus trilobata*: "...petala a me non visa subtridentata dicta", Dingler has pointed out that there is one other character of the new variety, concerning the tips of petals which are to be: "...meist ganzrandig oder etwas ausgerundet sind, oder auch in die kurze stumpfe Lappchen endigen". Labillardière (1812) claims in fact that "*Crataegus trilobata*" from Lebanon has petals "...apice trifida, aut emarginata", however Trabut (1918) and Stapf (1933) came to the conclusion, that in this respect there is considerable variation and that even in one flower it is possible to find petals with entire margins and three lobed ones. Herbarium specimens of *E. trilobatus* that have been collected during flowering and that I have seen, confirm this observation. Unfortunately I have not seen the classical specimen of Dingler's var. *rumelica* and I even do not know whether such a specimen does exist.

On the basis of information from the literature, there exists a certain variability also in the colour of fruits. Poiret (Lamarck, 1810), Rehder (1927) and Krüssmann (1962) claim that fruits are red, but according to Bean (1951) they are red or yellow, while Wilhelm (1918) and Bouloumoy (1930) consider them as yellow or yellowish and Trabut (1918), Stapf (1933) and Terpó (1968) as greenish-yellow. Thus it can be supposed that *E. trilobatus* is represented by two forms, one with red fruits and the other with yellow or yellowish-green fruits. Whether these differences represent any systematic value only observations in the field made on living material can tell. On the basis of dry herbarium specimens it is difficult to determine the colour of fruits. It is also not unlikely that fruit colour is a reflection of the state of ripeness.

Below is a list of the synonyms of the genus *Eriolobus* and of its single species *E. trilobatus* and the respective literature references. Apart from that a list of herbarium specimens and of stands reported in the literature is presented. Names of the Herbaria from which the specimens cited come are abbreviated according to the "Index Herbariorum", 1964. In the case of herbarium specimens that I have not seen myself, I place the abbreviation *n.v.* = *non vidi*, and data from literature is accompanied by the author and the year of publication.

Genus *Eriolobus* (Ser.) Roemer

Roem. Fam. Nat. Reg. Veg. Syn. 3 : 216 (1847); Hutchinson, Genera Flower. Pl., 1 : 215 (1964).

Syn.: *Pirus* sect. *Eriolobus* Seringe in DC., Prodr. 2 : 636 (1825).

Cormus sect. *Eriolobus* (Ser.) Dene., Nouv. Arch. Mus. Hist. Nat. Paris 10 : 157 (1874).

Eriolobus (Ser.) Roem. sect. *Eueriolobus* Schneid., III. Laubhlzk. 1 : 725 (1906)

p.p.

Malus sect. *Eriolobus* (Ser.) Schneid., Feddes Repert. 3 : 179 (1906); Rehder, Journ. Arnold Arb., 2, 1 : 49 (1920); Rehder, Manual trees shrubs 392 (1927); sec. ed. 391 (1940); Henning, Züchter 17/18, 10 - 12 : 323 (1947); Terpó, Fl. Europ. 2 : 66 (1968).

Eriolobus trilobatus (Poir.) Roemer

Roem. Fam. Nat. Reg. Veg. Syn. 3 : 216 (1847); Wenzig, Linnaea 43 : 79 (1880); Rehder in Sargent Trees and Shrubs 1 : 74 (1903); Schneider, III. Laubhlzk. 1 : 726 (1906); Woronow, Bull. appl. Bot. Pl. Breed. 14 : 61 (1924 - 25); Stapf, Bot. Mag. t. 9305 (1933); Zohary, Arboreal Fl. Israel, Imper. Forestry Inst., Univ. Oxford, No 26 : 22 (1951); Stojanov, Kitanoff, Veltshev, Bull. Inst. Bot. Sofia 4 : 112 (1955); Hutchinson, Genera Flower. Pl. 1 : 215 (1964).

Syn.: *Crataegus trilobata* Poir. in Lam. Encycl. Méth. Bot., Suppl. 1 : 291 (1810); Labillardière, Ic. Pl. Syriae Rar., Dec. 4 : 15 (1812); Kotschy, Libanon u. seine Alpenflora 34 (Verg. Zool. — Bot. Ges. 14 : 764) (1864); Kotschy in Petermann's Geogr. Mitth. 345 (1865).

Pyrus trilobata (Poir.) DC. Prodr. 2 : 636 (1825); G. Don, Gen. Syst. 2 : 648 (1832); Loudon, Arbor. et Frutic. Brit. 2 : 860 (1838); Endlicher, Gen. Pl. 1237 (1839); Focke, Abhandl. Naturw. Ver. Bremen 13 : 84 (1894); Hortus Mortolensis 256 et 420 (1912); Trabut, Rev. Hort. 8 (1918); Bean, Trees Shrubs Brit. Isl. 2 : 298 (1921); Osborn, Gard. Chron., Ser. 3., 72 : 341 (1922); Mottet, Arbres et arbustes ornament. 193 (1925).

Sorbus trilobata (Poir.) Heynhold, Nomencl. Bot. 1 : 773 (1841); Boissier, Fl. Or. 2 : 657 (1872); Wenzig, Linnaea 38 : 51 et 68 (1874); Dingler, Zeitschr. Deutsch. Oest. Alpenver. 208 (1878); Wenzig, Jahrb. Bot. Gart. Berlin 2 : 295 (1883); Post, Fl. Syr. Palest. Sinai 310 (1896); Hedlund (Monograph d. Gatt. Sorbus) Kong. Svensk. Vet. Akad. Handl. 35 no. 1 : 108 (1901); Hayek, Prodr. Fl. Penins. Balc. 1 : 750 (1926); Bouloumoy, Fl. Liban. et Syr. 117 (1930); Eig, Feddes Repert. (Beihft.) 63 : 126 (1931); Post, Dinsmore, Fl. Syr. Palest. Sinai 1 : 455 (1932); Mouterde, Végétat. Arborese. Pay du Levant (Publ. Tech. Scient. École Franc. Ingén. Beyrouth No. 13) 26 (1947); Zohary, Bull. Resch. Counc. Israel. Sect. D. Bot., 9D, 2 : 57 (1960); Stojanov, Kitanoff, Wilde Nutzpflanzen Bulgariens 145 (1960); Zohary, Pl. Life Palest. 25, 97 et 109 (1962); Yaltirik, Rev. Fac. Sc. Forest. Univ. Istanbul, ser. A., 16, 1 : 156 (1966).

Crataegus trilobata Poir. var. *oxyloba* Kotschy — *in sched.* Pl. Syr. Bor. ex Amano prope Beilan (1862).

Sorbus trilobata (Poir.) Heynhold var. *oxyloba* (Kotschy) Boiss., Fl. Or. 2 : 657 (1872); Hedlund (Monograph. d. Gatt. Sorbus) Kong. Svensk. Vet. Akad. Handl. 35 no. 1 : 108 (1901); Post, Fl. Syr. Palest. Sinai 310 (1896); Post, Dinsmore, Fl. Syr. Palest. Sinai

1 : 455 (1932); Feinbrun, Beihft. Bot. Centralbl. Abt. 2., 51 : 378 (1933); Thiebaut, Fl. Liban. et Syr. 2 : 104 (1940).

Cormus trilobata (Poir.) Deene. Nouv. Arch. Mus. Hist. Nat. Paris 10 : 157 (1874); Koehne, Gatt. Pomac. 24 (1890).

Pyrus trilobata (Poir.) DC. var. *rumelica* Dingler, Flora 61 : 303 (1883).

Sorbus trilobata (Poir.) Heynhold var. *rumelica* (Dingler) Boiss. Fl. Or. Suppl. 199 (1888); Hayek Prodr. Fl. Penins. Balc. 1 : 750 (1926).

Malus trilobata (Poir.) Schneid. Feddes Repert. 3 : 179 (1906); Schneider, Bull. Herb. Boiss. 2 ser. 7, 1 : 55 (1906); Schneider, III. Laubhbk. 2 : 1001 (1912); Zabel, Mitt. d. Deutsch. Dendr. Ges. 83 (1907); Wilhelm, Mitt. Deutsch. Dendr. Ges. 198 (1918); Rehder, Jour. Arnold Arb. 2, 1 : 49 (1920); Rehder, Manual trees shrubs 400 (1927); sec. ed. 398 (1940); Henning, Züchter 17/18, 10 - 12 : 323 (1947); Bean, Trees Shrubs Brit. Isl., 7 ed., 2 : 308 (1951); Hendriks, Onze Loofhoutgewassen 385 (1957); Krüssmann, Handb. Laubgehölz. 2 : 119 (1962); Vassilezenko, Nowye dlja kult. widy jabloni 112 (1963); Mouterde, Fl. Liban, Syrie (conspectus) 44 (1965); Terpó, Fl. Europaea 2 : 66 (1968).

Eriolobus trilobatus (Poir.) Schneid. var. *oxylobus* (Kotschy) Schneid., III. Laubhbk. 1 : 726 (1906).

Malus trilobata (Poir.) Schneid. var. *oxyloba* (Kotschy) Schneid., Feddes Repert. 3 : 179 (1906); Rechinger, Arkiv f. Botanik 5, 1 : 191 (1960).

LOCALITIES

1. Bulgaria: M. Rhodope Orientale, in loco dicto Licana inter pagos Savirači et Odrinci, ad ca 160 m. s. m., 25. 5. 1954 c. fl., Stojanov, Velčev (SOM.); Ivajlovgrad (only fruits), 11. 1955, Djakov (SOM.).

2. Greece: In rupetribus littoralibus Thraciae meridionalis inter Makri et Maronia solo calcareo ad 400' ascendens rara, 9.5.1876 c. fl., Dingler — n. v. (Dingler, 1883); S. of Ferrai. *Quercus-Cistus* scrub. c. 1 km from town, alt. c. 50 m, 20.5.1961 c. fl., P. W. Ball. R. Wagstaffe 530 (LIVU.).

3. Turkey: Mt. Sypilo, 1837, Aucher-Eloy 1494 (G. P); East Anatolia: Bursah Hani — Edremit (Bahkesir), *Pinus brutia* forest, 10.5.1966, Hasan Peşmen 866 (Herb. Izmir Univ.); Solak Dagh, Zeytun, 3000', 11.5.1934 c. fl., E. K. Balls 1064 (BM.); Maraş, Hartlap Bölgesi, Uludaz, 6. 1950 Ismail Akbaş (ISTO. 1028) — n. v. (Yaltirik, 1966); Maraş, Başkonuş Tepesi, 10.1964, Tolgay Odabaşı (ISTO. 2140) — n. v. (Yaltirik, 1966); Maraş, Ahir Dağ, Sariçukur to Kazma, 800 - 900 m, 20.9.1965, Faik Yaltirik (ISTO. 4077) — n. v. (Yaltirik, 1966); Maraş to Andirin, Köslüköprüsü to Çuhadarlar, 900 m, 21.9.1965, Faik Yaltirik (ISTO. 4078) — n. v. (Yaltirik, 1966); Ex Amano, prope Beilan, in devexis inter vineta a Beilan versus Kara Tschausch montis Houd Dagh alt. 3000', 22.6.1862 c. fr., Kotschy 52 (G. JE. K.P.S.); Amanus: ad pag. Saouk Olouk, in colle aperto, solo schistoso-gneissaceo, ca. 800 m, 25.5.1933 c. fl., Samuelsson 5373 (S.); Umgebung von Seldiren, ca. 500 m, im *Pinetum*; Seldiren-Pass, neben einer Quelle, 500 - 600 m, 27.8. 1931 (Feinbrun, 1933); Umgebung von Souk-Oluk, 800 - 850 m, in einem abgeholtzen *Pinetum*, 9.7.1931 (Feinbrun, 1933).

4. Lebanon: In Libano, c. fr. Labillardière (G.K.P. — Typus); Tripoli, c. fr., Labillardière (G.); Eden, 9. 1855, Blanche (G. P.) — n. v.; Environ d'Ehden, 1869 c. fr. Blanche (JE. P.); Forêt d'Eden, 30.5.1880 Blanche (G.) — n. v.; 9 - 10. 1860, J. D. Hooker et D. Honburg (K.); Bekfaya, ad Naas, 22.8.1879 c. fr., Peyron 364 (G.); Upper Lebanon: Wadi Seshrise above Hermel 3000 - 5000', 16.8.1945 c. fr., P. H. Davis 9858 (K.); Forest of Ehden 1500 - 1600 m, 2.9.1931 c. fr., Eig, Zohary 273 (HUI.); Prope pagum Ehden in decliv. occid. versus cedretum vallis Ouadi Djehennam, solo cal-

careo, in rupestribus, ca. 1600 m, 16.6.1933, Samuelsson 6116, 6119 (S.); Ad Bscherre et circa Cedretum. In rupestribus totius Libani alt. 3000 - 5000', 30.7.1855 c. fr., Kotschy 369 (G. JE. K. P. S.); In reg. Arz Libnan, inter Bacharreh et Arz Er Rab, in declivi cretaceo, ca. 1650 m, 13.6.1933, Samuelsson 5994 (S.); Mt. Hermon, env. of Shib'ah, maquis-deciduous, 1300 - 1400 m, 10.10.1943 c. fr., D. Zohary, T. Kushnir 274 (HUJ.); Rashyeia, Mt. Hermon, 1863 - 64, B. T. Lowne (K.); bei Läsa in Thal der Nahr Ibrahim, 1000 m. Auf Jura Kalk, 5. 1899 c. fl.,? (LE.); Hadet el Djoubbeh, in colle arenaceo, ca. 1550 m, 12.6.1933 c. fl., Samuelsson 5940 (S.); Betw. Ptermeze a. Kafer Domine, 750 - 1165 m, 10.7.1934, Leg. Stud. Rer. Nat. 272 (HUJ.); An steinigen Berglehnen zwischen Schuer und Mrouj, 13.5.1903 c. fl., Kuegler (JE.); Brummana, Post. Herb. (Post, Dinsmore, 1932); Afka, Lortet in Barb. (Post, Dinsmore, 1932); Ghazir a. Tartij (Mouterde, 1965).

5. **Israel:** Hurfesh, Eig (Post, Dinsmore, 1932); Maquis near Safad, 1932, in herb. Dep. For. Pal. Gov. (Zohary, 1951).

After describing "*Crataegus trilobata*" Poiret (Lamarck, 1810) has named Syria as its country of origin while Labillardière (1812) and Kotschy (1864) Lebanon and these two countries are most commonly mentioned in the literature and on herbarium sheet labels. However most of the information comes from the period when under the name Syria regions much wider were understood than is the case to-day. When localizing the known stands of *Eriolobus trilobatus* one finds that they are primarily in Lebanon and then in southern Turkey (from Berit Dağı to the Amanus Mts.) while from the regions of present day Syria the stands are either lacking completely or are so inaccurately named that it is difficult to refer to Syria on their basis as the country of origin for the species. Besides Lebanon and southern Turkey it has been mentioned in western Asia also from northern Israel (Post, Dinsmore, 1932; Zohary, 1951), Hurfesh and Safad. In the countries mentioned it is described by the local population as "Machlis" (Kotschy, 1864; Boissier, 1872) or "Makhlis" and "Mahrîs" (Post, 1896). Balls (in sched.) also gives on a herbarium sheet label another name — "Horse apple" (fig. 3).

A real surprise was the discovery of *Pyrus trilobata* var. *rumelica* by Dingler (1883) far from the main region of its occurrence, in Greece, in southern Thrace, between Makri and Maronia. The distance of the stand in straight line from Lebanon is about 1100 - 1200 km. According to Dingler in Thrace there grow only individual shrubs or small trees of the variety. In spite of being cited later by Boissier (1888) and Hayek (1927) its systematic position was doubted since Stojanov and Stefanov (1948) considered it as a variety of *Sorbus torminalis* (as *Pyrus torminalis* (L.) Ehrh. var. *rumelica* (Dingler)). Presumably a considerable role in this similarity was played by leaves of the two species.

Among the synonyms of this so classified variety of Dingler Stojanov and Stefanov give the following name: *Sorbus torminalis* var. *strandjensis* Cretz. Authors of the Bulgarian dendrology have named it likewise (Černiavski, Plošakova, Nedjalkov, Dimitrov, 1959). This view was completely false, since "var. *rumelica*" has nothing in common with "var. *strandjensis*". This latter variety as can be seen from the drawing of a leaf pre-

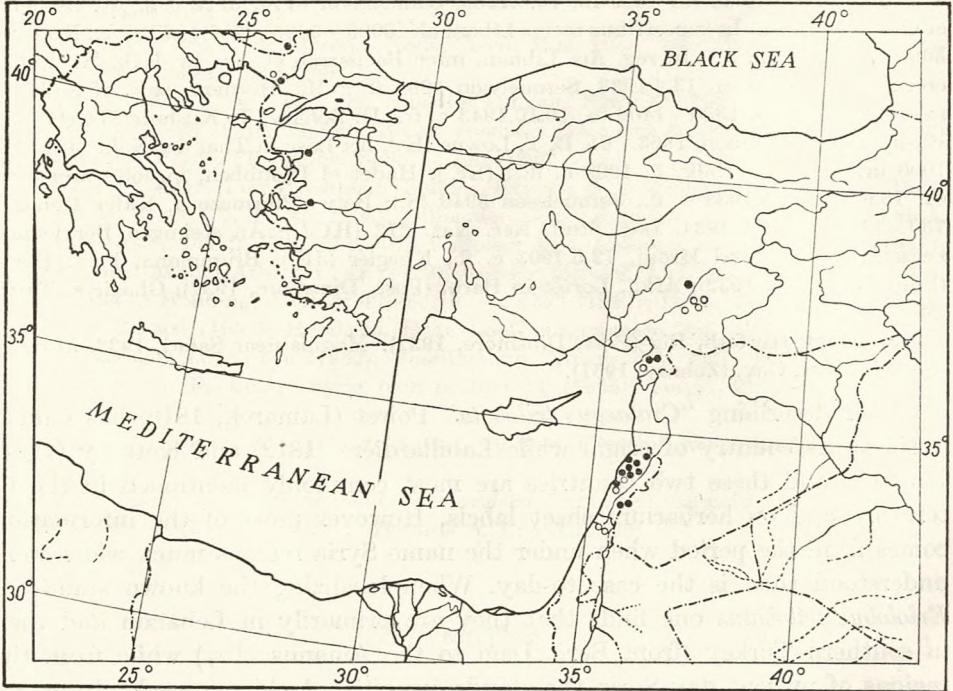


Fig. 3. The distribution of *E. trilobatus*. 1. herbarium specimens, 2. literature

sented in the work of Cretzoiu (1935) is only a large leaf (up to 17 cm long) variety of *Sorbus torminalis*. This would imply that *Eriolobus* does not grow in Bulgaria.

The discovery of Dingler has found confirmation, not very long ago namely in 1961, when Ball and Wagstaffe (*in sched.*) have found in Thrace a further specimen near Ferrai, and therefore somewhat east of Dingler's stand (fig. 4). The presence of *E. trilobatus* in Thrace automatically brings forward the question, how to explain the great disjunction (Lebanon - Thrace). Dingler pondered the question and supposed that there could have been two reasons for the disjunction: 1. That *E. trilobatus* has been brought to Thrace by accident and distributed by birds (the fruit is edible), 2. That the stand in Thrace is a remnant of an older, much wider range, which got disrupted. Since at the time of Dingler the knowledge of Turkish flora was still insufficient there is nothing surprising in that he did not exclude the possibility of the existence of stands in between that have not been found yet. A partial confirmation of this view can be found in the discovery of *E. trilobatus* in Turkey in the region of Maras, (Balls, *in sched.*; Yaltirik, 1966). However these stands are positioned on an extension towards the north of the Lebanese stands, and reduce the disjunction only to a very slight degree.

It is difficult to say today which of the two ideas of Dingler is closer to truth and whether in the present state of our knowledge of the Turkish flora

it will still be possible to find new stands in the region of the disjunction. As it happens one such stand exists, discovered in the first half of the nineteenth century, it has however been almost completely forgotten. This is con-

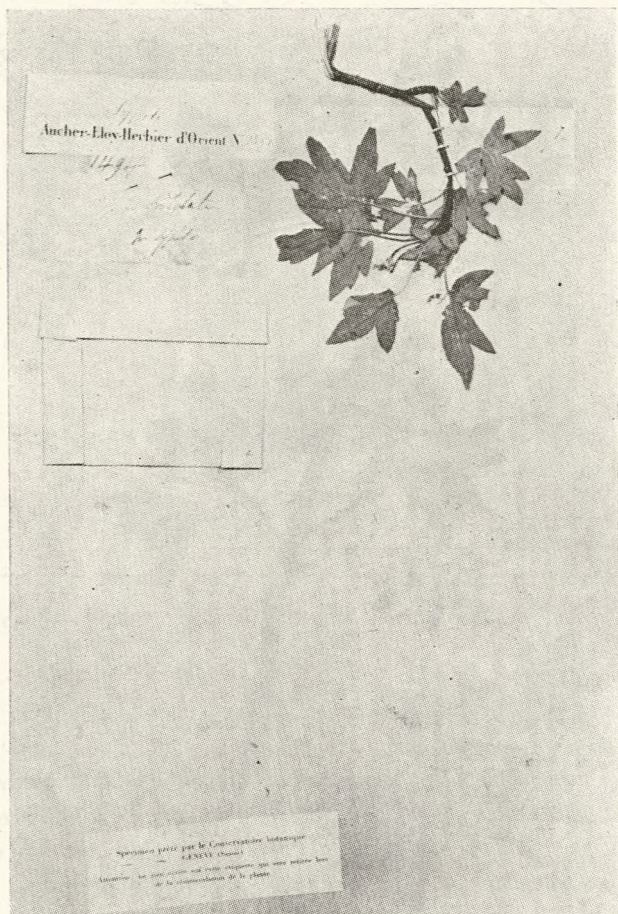


Phot. K. Jakusz

Fig. 4. A herbarium specimen of *E. trilobatus* with flowers from Thrace (The Hartley Botanical Laboratories, Liverpool)

firmed by the herbarium specimen of Aucher-Eloy no. 1494 which has been missed by Boissier in his "Flora Orientalis". On the label of this specimen, described as *Pyrus trilobata*, its site of collection is mentioned as Mount Sypilo (presently Manisa Dag) positioned on the western shores of Turkey near Izmir, that is about 300 km south-east from the stands in Thrace (fig. 5). It is however interesting that since the days of Aucher-Eloy *E. trilobatus* has not been found by anyone in the vicinity of Izmir, in spite of the fact

that this region belongs to the better known ones in Turkey. However it grows also in this part of Turkey on one further stand about 120 km north of Izmir, between Bursah-Hani and Edremit. This has been established by



Phot. K. Jakusz

Fig. 5. One of the oldest herbarium specimens of *E. trilobatus* collected by Aucher-Eloy in western Turkey, near Izmir (Conservatoire et Jardin botaniques, Genève)

E. Garielian from the Botanical Institute in Yerevan (USSR, Armenia) on the basis of herbarium specimens of the genus *Sorbus* from the collection in Izmir University. One of the sheets collected in 1966 proved to be beyond doubt *E. trilobatus* which I was able to confirm myself.

A further surprise was the discovery of *E. trilobatus* in the eastern Rodopi in Bulgaria, about 70 km directly north of Dingler's stand. It has been found here in May 1954 in a locality named Licana, between Ivajlovgrad and the village Odrinci. A note about this new species for the flora of Bulgaria has been published by Stojanov, Kitanoff and Veltschev (1955). According

to Stojanov and Kitanoff (1960) it deserves to be introduced into cultivation. In spite of the fact that Bulgarian botanists consider *E. trilobatus* as a species growing in Bulgaria in a wild state, according to Terpó (1968) it is only naturalized there.

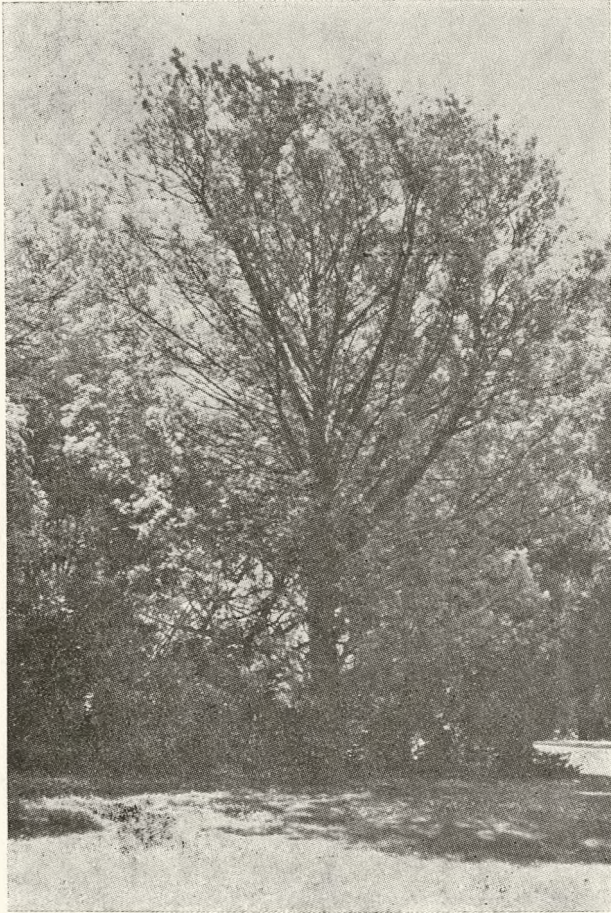


Phot. K. Jakusz

Fig. 6. A herbarium specimen of *E. trilobatus* with fruits from Lebanon (Hebrew University, Jerusalem)

Thus we know two regions of the occurrence of *E. trilobatus*. The first and richer one extends as a relatively narrow band from Süleymaniye in the south of Turkey up to Safad in northern Israel probably with a small disjunction in Syria. It is a mountainous region whose belts have a north-south run. In the south of Turkey *E. trilobatus* grows more or less at 500 - 1000 m eleva-

tion and as can be deduced from the photograph published by Yaltirik (1966) of the stands between Maras and Andirin and from the herbarium label of Samuelsson from the Amanus Mts. it grows on almost open sites. In Lebanon (fig. 6) it has been found at a height from 750 to 1800 m above the sea level,



Phot. Royal Bot. Gard. Kew

Fig. 7. A tree-form specimen of *E. trilobatus* growing in the Royal Botanic Gardens at Kew

most commonly however between 1300 and 1600 m on rocks, chalk or calcareous substrata, in *Cedrus* woods and in maquis. Presumably it is also cultivated here as can be deduced from the opinion of Kotschy (*in sched.*) who mentions *E. trilobatus* from vine-yards on the slopes of Amanus.

In north Israel, as has been mentioned by Zohary (1960) *E. trilobatus* is a species from the association *Quercus calliprinos* — *Pistacia palaestina* subsp. *galilaea* (oak maquis) and similarly as: *Acer spicatum*, *Prunus ursina*, *Gonocytisus pterocladus*, *Scilla palaestina*, *Dryopteris villarsi*, *Rubus tomentosus*,

Verbascum galilaeum, *Paeonia corallina*, *Hedera helix* it does not grow anywhere else outside this subassociation in Israel.

In the second much smaller region of occurrence in Thrace *E. trilobatus* has been reported from an elevation of 50 - 130 m. Here too it grows on a calcareous, rocky substratum, in evergreen thickets (Dingler, 1883) together with *Quercus* and *Cistus* (Ball, Wagstaffe, *in sched.*). In the eastern Rodopi it grows near thickets with such species as: *Phillyrea media*, *Quercus pubescens*, *Carpinus duinensis*, *Juniperus oxycedrus*, *Coronilla emeroides*, *Cornus mas* and others at an elevation of about 160 m (Stojanov, Kitanoff, Veltshev, 1955).

The date of introduction of *E. trilobatus* into cultivation in Europe as an ornamental species is not known exactly. Loudon (1838) believes that it was in 1810, while Rehder (1927) moves this date all the way to 1877. Stapf (1933) believes that introduction came around the year 1860 since the botanical garden of La Mortola has received *E. trilobatus* from Veitch and Sons in 1868 (Hortus Mortolensis, 1912). This can be supplemented with the information that in the herbarium of the Museum of Natural History in Paris there is a sheet from a young specimen of *E. trilobatus* that has been obtained from seeds brought by M. Blanche from Syria (?) in the years 1873 - 74.

The dimensions *E. trilobatus* reaches in cultivation are it appears much greater than when the species grows in its native habitat. In the wild state it is a shrub or a small tree 5 - 6 m tall (Yaltirik, 1966). In La Mortola a 65 - 70 year old specimen of *E. trilobatus* measured 10.45 m in height and 157 cm in girth (Stapf, 1933). In the Kew Gardens (fig. 7) there are presently two specimens (probably from the year 1900), which in 1968 have attained the following dimensions: about 9 m in height and 92 cm in girth, and 5.2 m in height and 36 cm girth (these data were kindly provided by R. D. Meikle from Kew).

In spite of the fact that *E. trilobatus* is a very ornamental species, both in its bloom and in leaf, it is rarely found in cultivation. It is reported from Germany, Holland, Denmark, England, France and Austria (Zabel, 1907; Trabut, 1918; Wilhelm, 1918; Stapf, 1933; Krüssmann, 1962). In western Europe it is resistant to frosts, is healthy, flowers and fruits. Its fruits, little "apples" are unsuited for direct consumption, since they are too sour, they can however be used for the preparation of excellent jellies (Trabut, 1918). *E. trilobatus* is said to propagate easily from seed and through grafting onto *Sorbus*, *Pyrus* and *Crataegus* (Trabut, 1918; Stapf, 1933).

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KAZIMIERZ BROWICZ

Eriolobus trilobatus (Poir.) Roem.

Streszczenie

W roku 1810, na podstawie okazu zielnikowego zebranego przez Labillardière'a w roku 1787 w Libanie, opisał Poiret nowy gatunek głogu — *Crataegus trilobata* Poir. Dokładną diagnozę łacińską tego gatunku oraz rysunek ulistnionej gałązki z owocami sporządził w dwa lata później sam Labillardière (1812). *C. trilobata* okazał się niezmiernie interesującym taksonem, który już od samego początku przysparzał systematykom wiele kłopotu w prawidłowym zaklasyfikowaniu do odpowiedniego rodzaju i właściwie biorąc sprawa ta jeszcze do dziś nie została definitywnie załatwiona. I tak De Candolle w 1825 roku zaliczył gatunek Poireta do rodzaju *Pyrus*, jako *P. trilobata* i umieścił go w oddzielnej sekcji *Eriolobus*. Następnie w roku 1841 Heynhold przeniósł go do rodzaju *Sorbus* (jako *S. trilobata*), a w roku 1874 Decaisne do rodzaju *Cormus* (jako *C. trilobata*). Roemer (1847) godząc ze sobą te sprzeczne poglądy Poireta De Candolle'a i Heynholda oraz podkreślając indywidualne cechy *Crataegus trilobata* utworzył dla niego samodzielny rodzaj *Eriolobus*, z jednym gatunkiem *E. trilobatus*. Z tą koncepcją zgadzali się początkowo Rehder (1903) i Schneider (1906a), jednakże w swych późniejszych pracach potraktowali oni rodzaj *Eriolobus* jako sekcję w rodzaju *Malus* — przedstawicielem tej sekcji jest *M. trilobata*. Ostatnio Hutchinson (1964) przywrócił odrębność rodzajowi *Eriolobus* i umieścił go w swym systemie między rodzajem *Pyrus* i *Malus*. Pogląd ten znajduje potwierdzenie również w badaniach fitochemicznych przeprowadzonych przez Williamsa (1964, 1966) nad 25 gatunkami rodzaju *Malus*. U gatunków tych stwierdził Williams obecność florydyny, jednego z najlepiej poznanych dwuhydrochalkonów. Jednakże u *M. trilobata* w miejscu florydyny występuje jej izomer nazwany przez Williamsa trilobatyną.

Rodzaj *Eriolobus*, jak się wydaje, jest najbliższej spokrewniony z jabłoniami z sekcji *Docyniopsis* (3 gatunki we wschodniej Azji), które charakteryzują się owocami o średnicy 3 - 5 cm (u *Eriolobus* około 2 cm), kwiatostanami złożonymi z 2 - 5 kwiatów (u *Eriolobus* do 10, zwykle 6 - 8), a liśćmi przeważnie całkowitymi lub płytko klapowanymi (u *Eriolobus* pierzasto-klapowane).

E. trilobatus jest gatunkiem rzadkim, występującym głównie w Libanie oraz w południowej Turcji (okolice miasta Maraş, góry Amanus). Oprócz tego znany jest z północnego Izraela. Rośnie on na wysokości 500 - 1800 m n. p. m. na skalnym, wapiennym podłożu, w lasach lub w zaroślach na odkrytych miejscach. W literaturze często wymieniany jest z Syrii, jednak dane te odnoszą się od okresu sprzed pierwszej wojny światowej, kiedy to pod pojęciem Syrii rozumiano obszary o wiele rozleglejsze niż to ma miejsce dzisiaj. We współczesnych granicach, *E. trilobatus* z Syrii nie jest podawany.

W roku 1876 gatunek ten został odkryty przez Dinglera (1883) także w Europie, a mianowicie w Grecji, w południowej Tracji. Dingler znalazł go tu między miejscowościami Makri i Maronia, na wysokości około 130 m n. p. m. Odkrycie Dinglera zostało niedawno potwierdzone przez Balla i Wągstaffe'a (*in sched.*) którzy zebrali *E. trilobatus* w niedalekiej odległości na wschód od stanowiska Dinglera. Obecność *E. trilobatus* została również stwierdzona w 1837 roku przez Aucher-Eloya (*in sched.*) u zachodnich wybrzeży Turcji, na górze Sypilo, koło Izmiru. Od tego jednak czasu, choć okolice Izmiru są botanicznie dobrze poznane, nikt więcej tego gatunku tam już nie oglądał. Odległość jaka dzieli stanowiska europejskie od stanowisk turecko-libańskich wynosi w prostej linii około 1100 - 1200 km. Być może, że jak to przypuszczał Dingler, w przyszłości zostaną odkryte na obszarze tej wielkiej dysjunkcji dalsze, nowe stanowiska.

W tej części zasięgu *E. trilobatus* został znaleziony jeszcze dwukrotnie — w roku 1953 w południowej Bułgarii, między Iwajlowgradem a wioską Ordinci, oraz w roku 1966 w zachodniej Turcji, około 120 km na północ od Izmiru, między Bursah Hani a Edremit.

Autor na podstawie dotychczasowych materiałów zielnikowych wypożyczonych z wielu zielników oraz danych z literatury zestawił wszystkie do tej pory znane stanowiska *E. trilobatus* i opracował punktową mapę jego rozmieszczenia. Oprócz tego podaje pełny zestaw synonimów tego gatunku i cytatów z literatury oraz krytycznie ustosunkowuje się do wyodrębnionych dwóch odmian: var. *oxyloba* i var. *rumelica*. Autor przypuszcza jednak, że byłoby rzeczą wskazaną wyróżnić u *E. trilobatus* nową odmianę, która charakteryzuje się liśćmi o szerokich i tępych klapach — dla tej odmiany proponuje on nazwę — var. *obtusiloba*.

КАЗИМЕЖ БРОВИЧ

Eriolobus trilobatus (Poir.) Roem.

Резюме

В 1810 г. Пуаре, основываясь на гербарном образце, собранном Лябиллярдьё в Ливане еще в 1787 г., описал новый вид боярышника — *Crataegus trilobata* Poir. Детальный латинский диагноз этого вида и рисунок облиственной ветки с плодами опубликовал через два года сам Лябиллярдьё (Labillardière, 1812). *C. trilobata* оказался необыкновенно интересным таксоном, с самого начала доставившим много хлопот систематикам, не знавшим к какому роду его отнести. Строго говоря, этот вопрос окончательно не решен до сих пор.

Декандоль в 1825 г. отнес вид Пуаре к роду *Pyrus* как *P. trilobata*, поместив его в особую секцию *Eriolobus*. Хейнхольд в 1841 г. перенес вид в род *Sorbus* (как *S. trilobata*), а Декене в 1874 г. в род *Cormus* (как *C. trilobata*). Ремер (Roemer, 1874), сопоставив про-

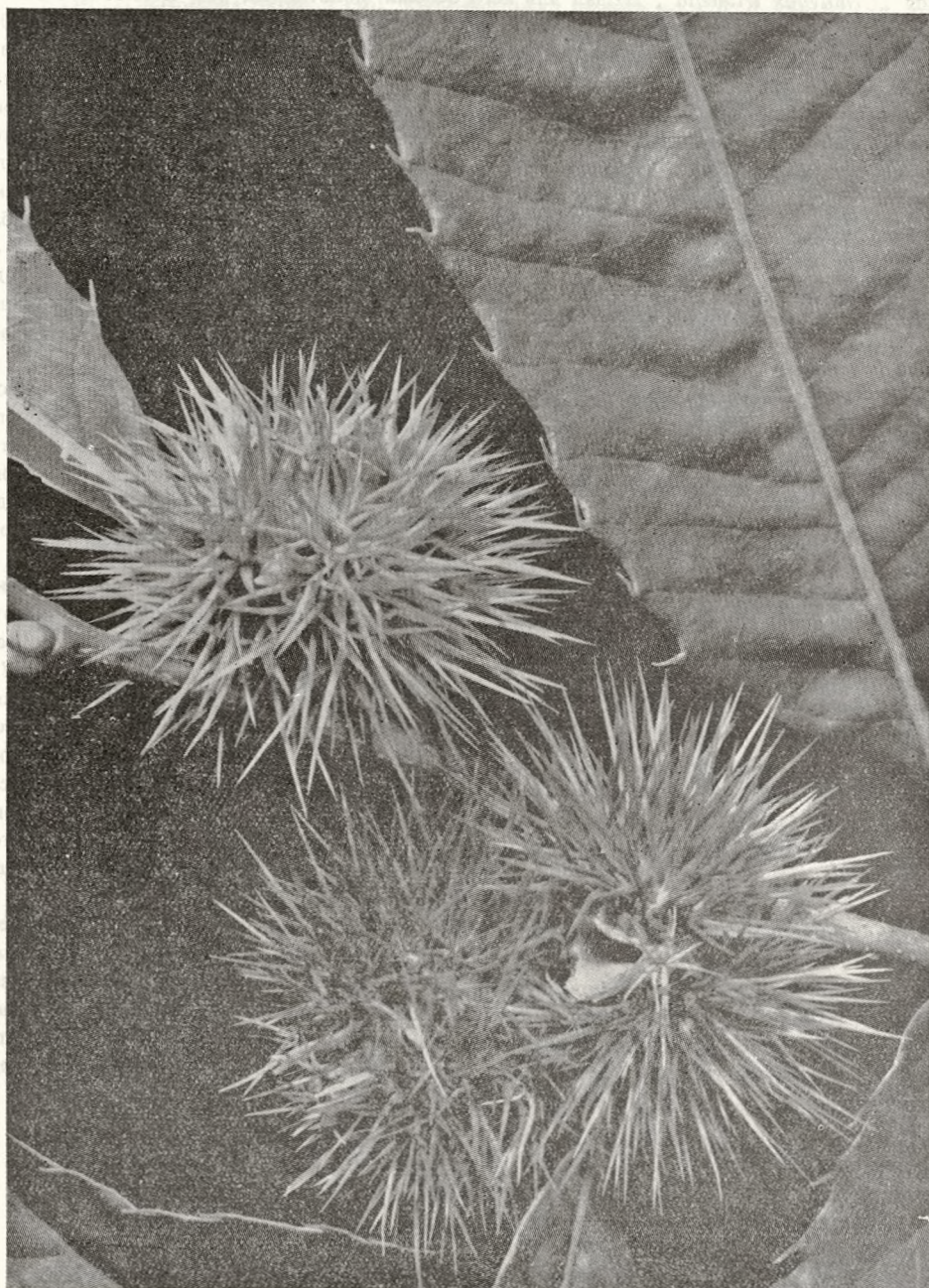
тиворечивые точки зрения Пуаре, Декандоля и Хейнхольда и подчеркнуть характерные отличия „*Crataegus trilobata*”, создал для него особый монотипный род *Eriolobus* с видом *E. trilobatus*. С такой концепцией первоначально согласился ряд ботаников (Rehder, 1903; Schneider, 1906a), однако в своих дальнейших работах они трактовали *Eriolobus* как секцию рода *Malus*, дав виду Пуаре название *M. trilobata*. Уже в самое последнее время Хетчинсон (Hutchinson, 1964) восстановил *Eriolobus* как самостоятельный род, поместив его в своей системе между родами *Pyrus* и *Malus*. Эта точка зрения нашла подтверждение в фитохимических исследованиях 25 видов рода *Malus* (Williams, 1964, 1966). У этих видов было установлено наличие флоридзина, однако из наиболее изученных дигидрохалконов. Однако у *M. trilobata* вместо флоридзина был найден его изомер, названный Вильямсом трилоба-тином.

Род *Eriolobus*, по-видимому, ближе всего к яблоням из секции *Docyniopsis* (три вида из восточной Азии), для которых характерны: плоды диаметром 3—5 см (у *Eriolobus* около 2 см), соцветия из 2—5 цветков (у *Eriolobus* до 10, обычно 6—8), листья преимущественно цельные или неглубоко лопастные (у *Eriolobus* перисто-лопастные).

E. trilobatus — редкий вид, встречающийся главным образом в Ливане и в южной Турции (окрестности города Мараш, горы Аманус). Кроме того, известен из северного Израиля. Растет на высоте 500—1800 м над ур. м., на скалистом известняковом грунте, на открытых местах в лесах или в зарослях. В литературе часто указывается из Сирии, но эти данные относятся к периоду до 1 мировой войны, когда Сирией называлась гораздо большая территория, чем теперь. В современных границах *E. trilobatus* в Сирии не встречается.

В 1876 г. этот вид был открыт Динглером (Dingler, 1883) в Европе, в именно в Греции (южная Фракия). Он был найден между населенными пунктами Макри и Марония, на высоте около 130 м над ур.м. Открытие Динглера было подтверждено, т.к. *E. trilobatus* был собран недалеко на восток от ранее указанного местонахождения (Ball a. Wagstaff, *in sched.*). *E. trilobatus* отмечался также в 1837 г. (Aucher-Eloy, *in sched.*) на западном побережье Турции (гора Сыпило около Измира). Однако, несмотря на хорошую изученность окрестностей Измира, с тех пор никто больше не находил здесь этот вид. Европейские местонахождения разделены от турецко-ливанских расстоянием в 1100—1200 км по прямой линии. Быть может, как предполагал сам Динглер, в будущем будут найдены новые местонахождения в районе этой дизъюнкции. В этой части ареала за последнее время открыто еще два новых местонахождения *E. trilobatus* — в 1953 г. в южной Болгарии между Ивайловградом и Ординци и в 1966 г. в западной Турции километров 120 на север от Измира.

Автор, на основе доступных ему гербарных материалов, полученных из ряда гербариев, а также используя литературные данные, составил точечную карту ареала *E. trilobatus*, нанеся на нее все известные местонахождения вида. Кроме того, он приводит полную синонимику таксона. Автор критикует выделение в составе вида двух разновидностей (*var. oxyloba*, *var. rumelica*), в то же время считая необходимым выделить новую разновидность, характеризующуюся листьями с широким и тупыми долами. Для этой разновидности предлагается название — *var. obtusiloba*.



Castanea sativa Mill. — owoce

Fot. K. Jakusz