Fragm. Flor. Geobot. 45(1–2): 273–280, 2000

Where is the place of origin of Morus nigra (Moraceae)?

KAZIMIERZ BROWICZ

BROWICZ, K. 2000. Where is the place of origin of *Morus nigra* (Moraceae)? *Fragmenta Floristica et Geobotanica* 45(1–2): 273–280. Kraków. ISSN 0015–931x.

ABSTRACT: Both literary and archaeo-botanical records indicate that *Morus nigra* L. thrived in the Near East and in Europe, at least since the Iron Age and Roman times. This is much earlier than *M. alba* L., which is native to China and which was introduced into this area (together with silkworms) in late Byzantine times or even later. Some *M. alba* forms have black fruits. Thus, contrary to what the botanical names imply, fruit color (black vs. white) is not a reliable trait to identify the two mulberry species. Indeed, considerable confusion has been caused by its use. Instead, *M. nigra* and *M. alba* can be distinguished from each other easily by their leaf morphology. The place of origin of *M. nigra* is still undetermined. The available information (literature, herbarium collections, etc) seems to be concerned only with cultivated forms and/or sub-spontaneous individuals. Genuinely wild populations of *M. nigra* are quite common in the Aegean region.

KEY WORDS: history of *Morus nigra*, distribution, Europe

K. Browicz, Institute of Dendrology, Polish Academy of Sciences, Parkowa 5, PL–62–035 Kórnik, Poland

Morus nigra L. belongs to the group of tree species that lack precise data concerning their occurrence in a wild state. The existing data are quite numerous but often contradictory, and usually concern old and cultivated specimens. It is hard to establish where and when the first information on the subject appeared. Linnaeus in his *Species Plantarum* lists the black mulberry, but from coastal areas of Italy only, and this mention occurs after *Pinax Theatri Botanici* (1671) by Bauhin, who uses the name *Morus fructo nigro* (Fig. 1).

The first information on the introduction of *Morus nigra* into England comes from 1548 (Loudon 1854; Rehder 1949a). Unfortunately, the origin of the introduced material remains uncertain. It might have been Italy because, as Loudon writes (l.c.), "it [i.e. *M. nigra*] is occasionally found apparently wild in Italy." Much earlier, *Morus nigra* was known to Pliny; it is even represented in paintings from Pompeii (Schreiber 1958). It turns out that even earlier it was mentioned in the Bible (Zohary 1982), and Kučan (1995) reports on remains of *Morus nigra* in a 7th century B.C. context in Samos.

The interpretation of the Hebrew name is not clear enough and it might denote another tree. It is certain, however, that the name does not denote the white mulberry

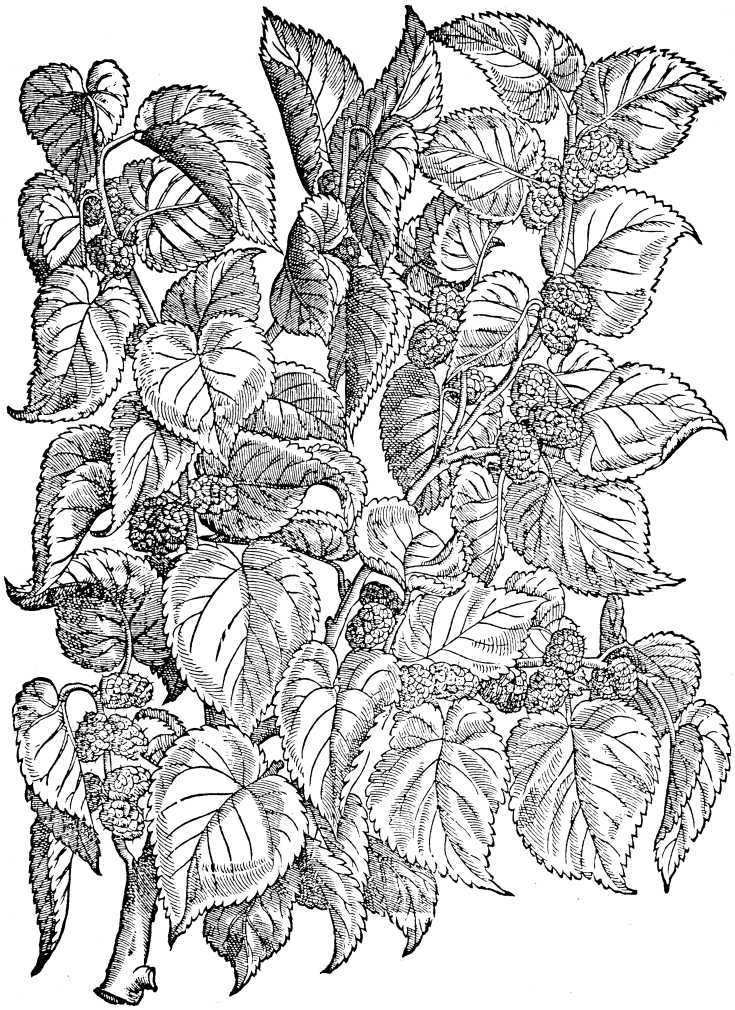

Fig. 1. *Morus nigra* L. – one of the oldest illustrations (Duhamel du Monceau. 1755. *Traite des arbes et arbustes qui se cultivent en France en pleine terre*. Vol. 12, Plate 8. Paris).

(*Morus alba* L.), the tree species exploited in sericulture. Silk was first brought to Greece in the 3rd century B.C. from Persia, which imported it from China by the Silk Route. The silk industry developed in Europe as late as 1146 in Sicily, from where it later expanded to Italy, Spain and southern France. This development was possible thanks to cultivation of the white mulberry – the source of food for silkworms; the leaves of black mulberry were little esteemed for this use.

The introduction of the white mulberry into Europe and the Middle East led to much confusion of its name with that of the black mulberry, and very often the two species were not differentiated. The problems with identification could be explained by the exist-

ence of white mulberry bearing black fruit; it was described as f. *nigrobacca* (Rehder 1949b) or var. *nigra* (Sabeti 1976). Misidentifications of this kind occur even nowadays. Popov (1968) presents a picture of a black mulberry with leaves having cuneate bases and long fruit pedicels, which in fact are characteristics of the white mulberry. Zohary (1982) in his *Plants of the Bible* includes a color photograph of a leafy and fruit-covered branch of a black mulberry; while the fruit in the picture are colorful, the leaves have long petioles and obviously cuneate bases (though described in the text as "mostly lobed dentate"), which are all characteristics of *Morus alba*. The same misidentifications occur in pictures of *Morus nigra* in *A Traveller's Guide of the Woody Plants of Turkey* by Taylor (1984) and in *Pakistan Systematics* by Bhopal and Chaundhri (1977).

Presumably such misidentifications may be more common; the lack of pictures, descriptions, or herbaria raises doubts as to whether a given publication presents *M. nigra* or *M. alba*. The latter species is widespread in cultivation, especially in sericulture, while the black mulberry is treated mainly as a fruit tree abundantly bearing big and juicy fruit. The ripe fruit is dark red or black and its juice is sanguineous. However, large-fruited forms of the white mulberry are also known in southwest Asia, and the condensed juice of their fruit, sweet though bland, is used as candy.

According to Popov (1929), Europeans often do not distinguish the black mulberry from the white mulberry. The color of the fruit and the species name associated with it are so suggestive that other morphological characteristics remain undervalued. In the case of *M. nigra* the characteristics are the usually unlobed and scabridulous leaves with deeply cordate bases, the short and thick petioles that are often hidden in the base, as well as the thick shoots. *M. alba*, on the other hand, has ovate and soft leaves, wedge-shaped or oval at the base, usually irregularly lobed, with long and thin petioles; the annual shoots are thin and slender (Fig. 2).

In this situation it is not surprising that locating the areas where *M. nigra* grows in a wild state not only poses serious difficulties but proves literally impossible. As already mentioned, the black mulberry was known in the 1st century to Pliny and in the 17th century to Bauhin. In more recent times, Fenaroli and Gambi (1976) also point to Italy as the species' country of origin. However, it also grows outside the Mediterranean. It has been reported to be cultivated in southern Germany (Lorgus *et al*. 1912) and Great Britain, where 300-year-old trees exist (Loudon 1854). According to Hayek (1924–1927), *M. nigra* is cultivated or subspontaneous in the Balkan Peninsula – in Dalmatia, Croatia, Bosnia and Herzegovina, and Serbia. It is also known in Romania, Bulgaria and Albania. In Slovakia near Trnava I saw in vineyards a row of old trees, often with split trunks and fallen to the ground but still fruiting. These were even described by Domin (1928) as a new species – *Morus trnaviensis*.

Most authors suppose that *M. nigra* comes from Asia, either western Asia, especially from Persia (Loudon 1854; Brandis 1874; Schneider 1906; Lorgus *et al*. 1912; Rehder 1949a; Townsend 1980; Zohary 1982; Huxley & Taylor 1989) or central Asia (Yaltirik 1982; Heller & Heyn 1994). Such opinions might have been influenced by Boissier (1879), who believed that the black mulberry was presumably spontaneous in the forests of Transcaucasia, in Lenkoran**,** and in northern Persia on the Caspian Sea. In Boissier's

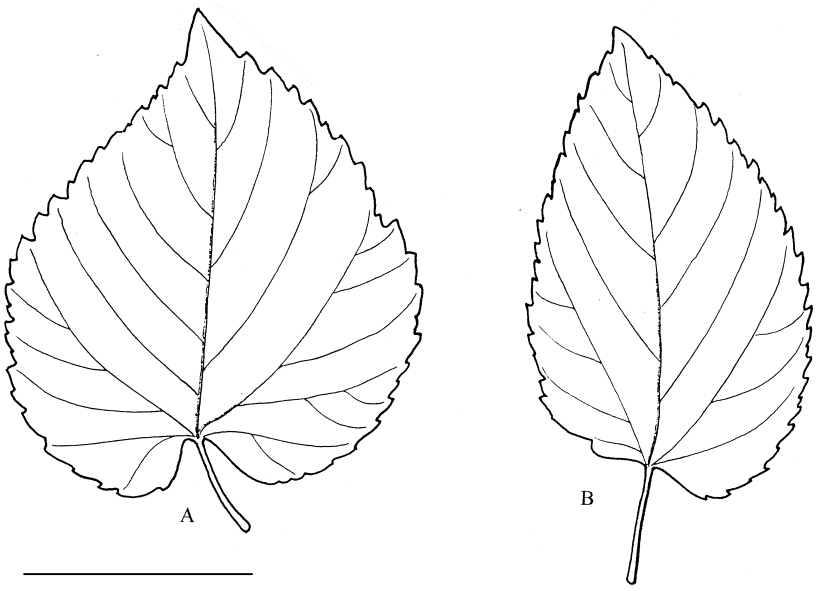

Fig. 2. Typical leaves of *Morus nigra* L. (A) and *Morus alba* L. (B). Scale bar: 5 cm.

time, the knowledge of the flora of southwestern Asia was still inadequate In Boissier's time, and only today, when the data is much more detailed, can we say that in the case of Turkey, Iran, Afghanistan and Central Asia the data concerns only cultivated trees, their cultivation having perhaps a very long tradition.

Zhukovskij (1964) writes that *M. nigra* is cultivated in the Caucasus, Central Asia, the Crimea, Moldavia and Ukraine, but he notes that it might grow wild in southwestern Asia. Grossheim (1949), the biggest authority on the flora of the Caucasus, is of a similar opinion. *M. nigra* is reported from the Crimea by Stankov (1947), but Kosych (1967) in his monograph on the fruit trees and shrubs of the peninsula does not mention the black mulberry at all, even though he discusses such 'fruit' species as *Elaeagnus angustifolia*, *Celtis caucasica* or *Vitex agnus-castus*.

In Turkey, according to Yaltirik (1982), *M. nigra* is "widespread in Anatolia, cultivated in gardens." The same concerns Iran and Afghanistan – I studied herbaria from these countries together with the collectors' annotations on the labels while preparing a description of the Moraceae family for *Flora Iranica* (Browicz 1982). Still in that region, the black mulberry is reported from Pakistan by Stewart (1972) and Ghafoor (1985), and from Kashmir by Singh and Kachroo (1987), who, however, cautiously point out that it is "usually cultivated, a few escapees in ravine." A radical opinion is represented by Zhukovskij (1964), who holds that *M. nigra* grows in a wild state in Ladakh, and at the altitude of 3500 m.

Thus, it seems fair to agree with Ghafoor (1985): "native area obscure, cultivated and subspontaneous in NW India, Pakistan westwards to Asia Minor, Central and South Eu-

rope, North Africa and Central Asia," and with Townsend (1980): "its precise origin has long been obscured by extensive cultivation."

M. nigra does not occur in a wild state anymore and any speculations as to its native area remain simply speculations. However, it is worth considering whether its original location was not in the Aegean, a region of Greece whose location midway on the route of exchange of fruit trees and shrubs between southern Europe and western Asia, could have played a significant role in the case of *M. nigra* also.

According to Brandis (1874), *M. nigra* "was surely introduced to Greece and thence to Italy." Its juicy and colorful fruit were used in medicine, were flavorful, and were considered refrigerant and laxative (Ghafoor 1985). They were also used for coloring wine. In modern times the black mulberry is seldom reported from Greece or else the data on it are quite vague, lacking information about the place of cultivation (Halácsy 1904; Turland *et al*. 1993); other authors, for example Voliotis and Athanasiadis (1971) or Baumann (1993), do not mention *M. nigra* at all. Hayek (1924–1927) does not mention it from the southern part of the Balkan Peninsula, and Greuter *et al.* (1989) believe that the black mulberry is problematic in Greece. It turns out, however, that *M. nigra* occurs quite often in the area, which I had a chance to verify myself during my exploration of the flora on some of the islands. It is best visible on the attached map which includes western Turkey as well (Fig. 3).

It cannot be excluded, then, that this area could be the native area of *M. nigra* and that from here it spread in cultivation both westward to southern Europe and far eastward to Iran, Afghanistan, and Pakistan, where it was taken during the conquests of Alexander the Great. In any case all this cannot and does not explain where the country of origin of *Morus nigra* really is. What is certain is that nowadays it has little use in cultivation, neither as a fruit nor as a decorative tree, and it is usually represented only by single, sometimes very old, specimens.

Known locations of Morus nigra *in the Aegean basin*

GREECE. **THRACE**. Konyankouy, sandy soil near hills, old trees much damaged by cutting of branches for the fruit. 04.05.1932, *Tedd 824* (K). **THASOS**. Mikron Prinos, tree planted not far from the road to Agios Pandeleimon, 18.06.1979, *Boratyński, Browicz & Zieliński 457* (KOR). **LEMNOS**. only old trees. One tree in Thanos; 2 trees near Avlonas; 3 trees near Agios Dimitrios, near a clump of *Quercus coccifera*; one tree between Romanou and Repandini, one tree in Roussopouli, one tree near Kaminia, two trees between Kaminia and Polichni (Browicz 1992). **CHIOS**. NE Chios, 1–3 km of Marmaron, neglected orchard. 11.05.1985, *Boratyński, Browicz, Zieliński 6* (KOR); abundantly represented and in almost every village. It is particularly common near Kambia, between Agion Gala and Melanios (Boratyński *et al*. 1987). **SAMOS**. Western part of the island – Marathocampos, Kalithea, Drakaioi (Christodoulakis 1986). **KOS**. Zia Asphendioy, in garden (Browicz 1993). A. Hansen (1980) mentions this tree as "Strassenbaum kultiviert" (probably *Morus alba*). **NISIROS**. Without locality (Papatsou 1975). **RHODOS**. Cultivated, without locality (Boratyńska *et al*. 1985; Carlström 1987). **KRITI**. Cultivated, without locality (Rechinger 1943; Turland *et al*. 1993). Nomos Iraklion. An old tree in devastated orchard near Mathia village, between Geraki and Kastelli, 29.05.1983, *Boratyńska et al. 228* (KOR). **KYTHERA**. Kapsali, cultivated (Greuter & Rechinger 1967). N. **SPORADES**. Yioura – few old trees remaining from cultivation (Kamari *et al*. 1988). **EVVOIA**. Eastern part of the island, near Platanistos (Browicz 1986). **LEVKAS**. Frequently

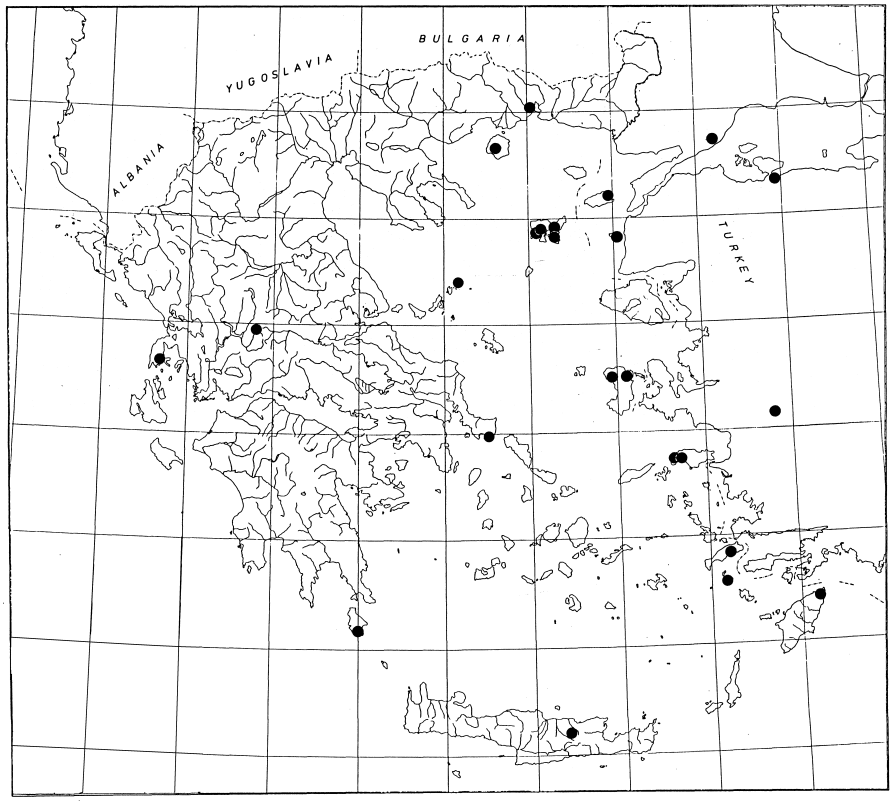

Fig. 3. Known locations of *Morus nigra* L. in the Aegean basin.

cultivated in the villages (Hofman 1968). **AETOLIA**. Valley of Tauropos river, near Kalesmanon, by the road to Karpenision, thickets in neglected orchard, 2.06.1988 *Boratyński, Browicz, Tomlik & Zieliński 869* (KOR).

TURKEY. **GANOSDAGI**. without locality (Webb 1966). **GÖKCEADA ISL**. Bademli köyű(Seçmen & Leblebici 1978). **BOZCAADA ISL**. Sulubahce (Seçmen & Leblebici 1978). **BALIKESIR**. Bandirma, (Yaltirik 1982). **IZMIR**. Ödemis (Yaltirik 1982).

References

BAUMANN H. 1993. Greek wild flowers and plant lore in ancient Greece. 294 pp. The Herbert Press, London.

BHOPAL F. G. & CHAUDHRI M. N. 1977. Flora of Pothohar and the adjoining areas, Part II. – Pakistan Syst. **1**(2): 1–98.

BOISSIER E. 1879. Flora orientalis sive enumeratio plantarum in Oriente a Graecia et Aegypto ad Indiae fines hucusque observatarum. **4**. 1276 pp. H. Georg, Basileae – Genevae – Lugduni.

BORATYŃSKA K., BORATYŃSKI A., BROWICZ K. & DOLATOWSKI J. 1985. Trees and shrubs of Rhodos – a monographic study. – Arbor. Kórnickie **30**: 127–199.

BORATYŃSKI A., BROWICZ K. & ZIELIŃSKI J. 1987. Woody flora of Chios. – Arbor. Kórnickie **32**: 37–92

BRANDIS D. 1874. The forest flora of north-west and central India (Repr. 1972). 608 pp. Jayed Press, Ballimarana, Delhi.

BROWICZ K. 1982. Moraceae. – In: K. H. RECHINGER (ed.), Flora Iranica **165**, pp. 1–15. Akademische Druck & Verlagsanstalt, Graz.

BROWICZ K. 1992. Trees and shrubs of Lemnos Is. (Greece). – Arbor. Kórnickie **36**: 5–25.

CARLSTRÖM A. 1987. A survey of the flora and phytogeography of Rhodos, Simi, Tilos and the Marmaris peninsula (SE Greece, SW Turkey). 302 pp. University of Lund, Lund.

CHRISTODOULAKIS D. 1986. Die Flora und Vegetation der Insel Samos (Griechenland). 382 pp. Ph. D. Thesis, University of Patras, Patras (in Greek).

DOMIN K. 1928. Nový slovenský druh Moruse z pribuzenstvě moruse cerné. Sv. **47**, pp. 3–29. Kniznica Slovenskej Ovocinárskej Spolecnosti, Bratislava (in Slovak).

FENAROLI L. & GAMBI E. 1976. Alberi (Dendroflora Italiana). 413 pp. Museo Tridento de Scienze Naturale, Trento.

GHAFOOR A. 1985. Moraceae. – In: W. NASIR & S. I. ALI (eds), Flora of Pakistan. **171**, pp. 1–54. Shamim Printing Press, Karachi.

GREUTER W. & RECHINGER K. H. 1967. Flora der Insel Kythera. – Boissiera **13**: 1–206.

GREUTER W., BURDET H. M. & LONG G. 1989. Med-Checklist **4**. 458 pp. Conservatoire et Jardin Botanique, Genéve.

GROSSHEIM A. A. 1949. Opredelitel rastenij Kavkaza ["Flora of the Caucasus"]. 747 pp. Sovetskaja Nauka, Moskva (in Russian).

HALÁCSY E. V. 1904. Conspectus Florae Graecae. **3**. 519 pp. G. Engelmann, Lipsiae.

HANSEN A. 1980. Eine Liste der Flora der Inseln Kos, Kalymnos, Pserimos, Telendos und Nachhar-Inselchen (Ostägäis, Griechenlaad). – Biol. Gallo-Hellen. **9**(1): 3–105.

HAYEK A. V. 1924–1927. Prodromus Florae Peninsulae balcanicae. **l**. – Feddes Repert. Beih. **30**: 1–1193

HELLER D. & HEYN C. C. 1994. Conspectus Florae Orientalis. **9**. 171 pp. Israel Academy, Jerusalem.

HOFMAN U. 1968. Untersuchungen an Flora und Vegetation der Ionischen Insel Levkas – Vierteljahrsschr. Naturf. Ges. Zürich **113**(3): 209–256.

HUXLEY A. & TAYLOR W. 1989. Flowers of Greece and the Aegean. 185 pp. Hogarth Press, London.

KAMARI G. *et al*. 1988. Flora and vegetation of Yioura, N. Sporades, Greece. – Willdenowia **17**(1–2): 59–85.

KOSYCH V. M. 1967. Dikorastushchie plodovye porody Kryma ["Wild fruit species of Crimea"]. 171 pp. Izdatel'stvo Krym, Simferopol (in Russian).

KUČAN H. 1995. Zur Emahrung und dem gebrauch von Pflanzen im Heraion von Samos im 7. Jahrhundret v. Chr. – Jahrb. Dtsch. Archaeol. Inst. **110**: 1–64.

LORGUS A., HESSE FR. & GEISENHEYNER L. 1912. *Morus nigra*, die schwarze Maulbeere. – Mitt. Deutsch. Dendrol. Ges. **21**: 201–210.

LOUDON J. C. 1854. Arboretum et Fruticetum Britannicum. Ed. 2. **3**. 1257–2030 pp. Henry G. Bohn, London.

PAPATSOU S. 1975. Flora and vegetation of the island Nisyros and surrounding islets. 138 pp. Ph. D. Thesis, University of Patras, Patras (in Greek with English summary).

POPOV M. G. 1929. Dikie plodovye derevia i kustarniki Srednej Azii ["Wild fruit trees and shrubs of the Middle Asia"]. – Trudy Prikl. Bot. Gen. Selekc. **22**(3): 241–483 (in Russian summary).

POPOV N. G. 1968. *Morus* L. – In: P. N. OVČINNIKOV (ed.), Flora Tadzhikskoy SSR ["Flora of Tadzhik SSR"]. **3**, pp. 165–169. Izdatel'stvo Nauka, Leningrad (in Russian).

RECHINGER K. H. 1943. Flora Aegaea. – Akad. Wiss. Wien, Math.-Naturwiss. Kl. Denkschr **105**(1): 1–924.

REHDER A. 1949a. Manual of cultivated trees and shrubs. Ed. 2. 996 pp. Macmillan, New York.

REHDER A. 1949b. Bibliography of Cultivated Trees and Shrubs. 825 pp. Jamaica Plain, Massachusetts.

SABETI H. 1976. Forests, Trees and Shrubs of Iran. 810 pp. Ministry of Information and Tourism Press, Tehran (in Farsi).

SEÇMEN Ö. & LABLEBICI E. 1978. Gökceada ve Bozcaada adalarinin ve florasi. – Bitki **5**(3): 271–368 (in Turkish).

SCHNEIDER C. K. 1906. Handbuch der Laubholzkunde. **I**. 810 pp. G. Fischer, Jena.

SCHREIBER A. 1958. *Morus* L. – In: Gustav Hegi Illustrierte Flora von Mittel-Europa. Ed. 2. **3**(1), pp. 273–274. Paul Parey, Berlin – Hamburg.

SINGH G. & KACHROO P. 1987. Forest Flora of Srinagar. 278 pp. Periodical Expert Book Agency, Delhi.

STANKOV S. S. 1947. Moraceae Lindl. – In: E. V. VULF (ed.), Flora Kryma ["Flora of Crimea"]. **2**(1), pp. 50–53. Ogiz-Selchogiz, Moskva – Leningrad (in Russian).

STEWART R. R. 1972. An annotated catalogue of the vascular plants of West Pakistan and Kashmir. 1028 pp. Fakhri Printing Press, Karachi.

TAYLOR S. 1984. A traveller's guide of the woody plants of Turkey. 126 pp. Redhouse Press, Istanbul.

TOWNSEND C. C. 1980. *Morus* L. – In: C. C. TOWNSEND & E. GUEST (eds), Flora of Iraq. **4**(1), pp. 80–84. Ministry of Agriculture and Agrarian Reform, Baghdad.

TURLAND N. J., CHILTON L. & PRESS J. R. 1993. Flora of the Cretan area. 439 pp. The Natural History Museum, London.

VOLIOTIS D. & ATHANASIADIS N. 1971. Dendra ke thamni ["Trees and shrubs"]. 294 pp. Arion, Thessaloniki (in Greek).

WEBB D. A. 1966. The flora of European Turkey. – Proc. Roy. Irish Acad. **65B**(1): 1–100.

YALTIRIK F. 1982. *Morus* L. – In: P. H. DAVIS (ed.), Flora of Turkey. **7**, pp. 641–642. University Press, Edinburgh.

ZAPRJAGAEVA V. I. 1964. Dikorastushchie plodovye Tadjikistana ["Wild fruit plants of Tajikistan"]. 695 pp. Izdatel'stvo Nauka, Moskva – Leningrad (in Russian).

ZHUKOVSKIJ P. M. 1964. Kulturnye rastenija i ich sorodichi ["Cultivated plants and their ancestors"]. 787 pp. Izdatel'stvo Kolos, Leningrad.

ZOHARY M. 1982. Plants of the Bible. 223 pp. Cambridge University Press, Cambridge.