

KAZIMIERZ BROWICZ

## Distribution of Woody *Rosaceae* in W. Asia IV

Almonds from the section *Spartioides* Spach.

In the year 1843 Spach has published in his monograph of the genus *Amygdalus* the first division of the almond species known at the time into series and sections. He has recognized two series — *Icosandrae* and *Dodecandrae*, which correspond to the present concepts of a subgenus, and 6 sections — *Spartioides*, *Chamaeamygdalus*, *Leptopus*, *Eruamygdalus*, *Lycioides* and *Scorpius*. In its general outline this division have remained accepted until to-day except that the number of sections has declined to five since Boissier (1872) has included section *Scorpius* into section *Lycioides*. As basis for the division into sections primarily the shape of the hypanthium in the flowers is considered.

Section *Spartioides* belongs to the most characteristic sections in the genus *Amygdalus*, and besides section *Lycioides* represents an extremal position in the evolution of the almonds. This evolution took place undoubtedly under the influence of the climate of western and Central Asia characterized by an ever increasing aridity. In section *Lycioides* this process went in the direction of a reduction of the leaf blade surface and the development of short shoots and thorns, while in section *Spartioides* it has led to an almost complete disappearance of short shoots, thornlessness and early leaf fall. The more important characteristics of this section are: Hypanthium bell-shaped, semi-globular, with sepals having curly pubescence on margins. Shoots virgate, green (presumably assimilating). Leaves in the buds conduplicate, emerging after the development of flowers, lanceolate, appearing primarily on one year old shoots, very sparsely localized and falling off already in the summer, thus the shoots are very often leafless. The endocarp has only one bundle of xylem and phloem.

Spach (1843) has included only three species in the section *Spartioides*, namely *Amygdalus arabica* Oliv., *A. spartioides* Spach and *A. scoparia* Spach. A fourth species, *A. agrestis* Boiss. has been described a few years later by Boissier (1849) and the next *A. glauca* Browicz I have described on the basis of herbarium materials from the Hebrew University, Jerusalem (Browicz, 1967). In 1905 Schneider (Schneider, 1906) when discussing the great similarity between *A. arabica* and *A. spartioides* has suggested that these two species be recognized as one. However it was Meikle (1965) who has

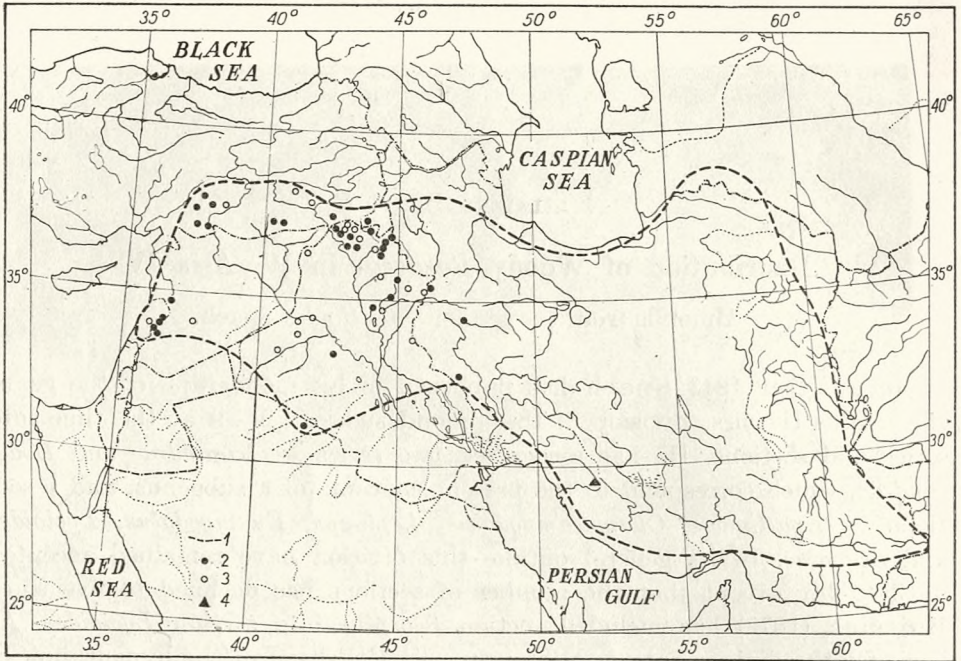


Fig. 1. Distribution of the almonds of section *Spartioides*: 1. range of distribution for the whole section, 2 - 3. *A. arabica* (2-herbarium specimens, 3 - literature), 4. *A. glauca*

joined the two species leaving the older name *A. arabica* to describe them both and considering *A. spartioides* as a synonym. Thus presently section *Spartioides* is represented by four species of which only two *A. scoparia* and *A. arabica* are characterized by extensive ranges of distribution, while the two remaining species are local endemic species represented by only few or even only one stand (fig. 1, 2). The morphological differences between the four species are slight so that an identification of them is often difficult, particularly when dealing with dry herbarium materials, represented by one year shoots deprived of leaves, flowers and fruits. As a result both in the literature and herbarium collections often errors are made in describing them and usually only *A. scoparia* and *A. spartioides* are mentioned.

The ranges of distribution of almonds in the section *Spartioides* have not been described yet and therefore having access to rich herbarium materials of over 180 sheets (Herbaria in Edinburgh, Genève, Jena, Jerusalem, Leningrad, Prague, Stockholm, Vienna and others) I was able to attempt such a description and to draw up on this basis maps of distribution. After having drawn in on the maps the stands as described on herbarium labels. I have decided to include also the data from the literature. In deciding into which species to include a specimen reported in the literature I have made much use of the information about the geographic localization of its stand. In comparison with the herbarium sheets the literature reports were rather few.

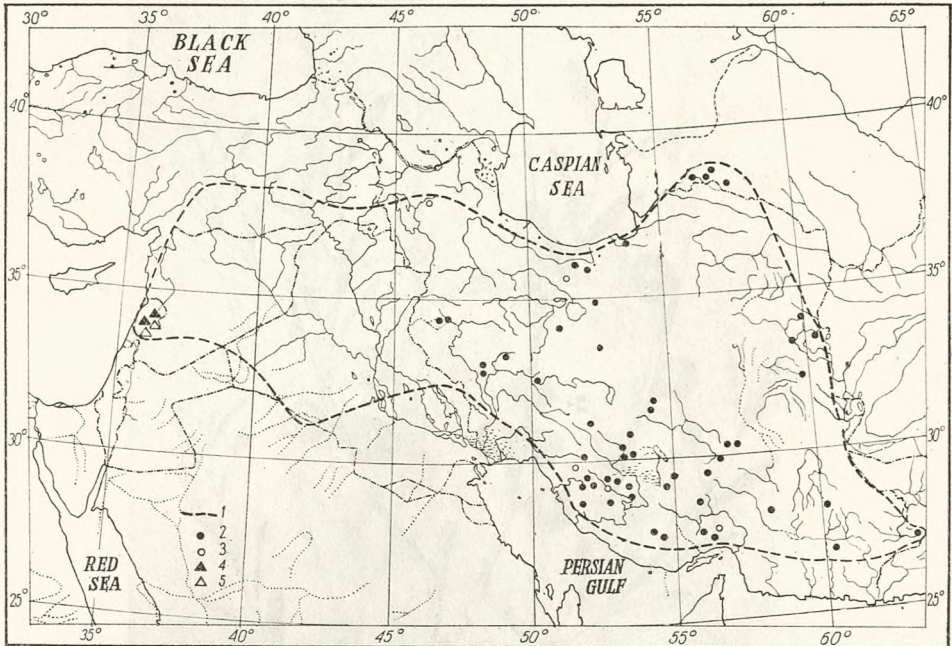


Fig. 2. Distribution of almonds from the section *Spartioides*: 1. range of distribution for the whole section, 2-3. *A. scoparia* (2 — herbarium specimens, 3 — literature), 4-5. *A. agrestis* (4 — herbarium specimens, 5 — literature)

#### 1. *A. ARABICA* OLIVIER

Voyage, 3 : 460 (1804); atlas, t. 47 (1804); Spach, Ann. Sc. Nat. Paris, 2. ser., 19 : 108 (1843); Jaubert, Spach, III. Pl. Or., Tab. 226B (1847); Kotschy, Libanon u. seine Alpenflora: 12 (Verh. Zool.-Bot. Ges. 14) (1864); Boissier, Fl. Or. 2 : 640 (1872); Schneider, III. Handb. Laubholz., 2 : 590 (1905); Velenovsky, Pl. Musiliana: 17 (Sitzungber. Königl. Böhmisches. Gesellsch. Wissensch. Jahrg. 1911), part 11 (1912); Woronow, Bull. appl. Bot. Genet. Pl. Breed., 14,3 : 49 (1924 - 25); Mouterde, Bull. Soc. Bot. France, 106,9 : 466 (1959); Mouterde, Fl. Liban, Syrie (Conspectus) : 43 (1965); Browicz, Fl. Iranica (manuscript, 1967).

Syn.: *A. spartioides* Spach — Jaubert, Spach, III. Pl. Or. Tab. 226A (1847); Boissier, Fl. Or. 2 : 64 (1872); Post, Fl. Syria, Palest. Sinai: 301 (1896); Woronow, Bull. appl. Bot. Genet. Pl. Breed., 14, 3 : 49 (1924 - 25); Post, Dinsmore, Fl. Syria, Palest. Sinai, 1 : 449 (1932); Balls, Gard. Chron., ser. 3., 98 : 406 (1935); Bornmüller, Beih. Bot. Centralbl. 58B: 252 (1938); Zohary, Palest. Jour. Bot. Jerus. Ser., 1, 3 : 249 (1939); Thiebaut, Fl. Libano-syrienne, 2 : 100 (1940); Mouterde, Publ. Techn. Sc. Ecole Franc. Ingen., Beyrouth No. 13 : 25 (1947); Blakelock, Kew Bull., 3 : 426 (1948); Zohary, Dep. Agr. Techn. Bull. (Fl. Iraq) 31 : 77 (1950); Rechinger, Arkiv. f. Bot. 1, 15 : 526 (1952); Rechinger, Arkiv. f. Bot., 5, 1 : 197 (1960); Rechinger, Fl. Lowland Iraq: 332 (1964); Rawi, Dep. Agr. Iraq Tech. Bull., 14 : 81 (1964); Mouterde, Fl. Liban, Syrie (Conspectus) (1965).

*Prunus spartioides* (Spach) Schneider, III. Handb. Laubholz., 1 : 590 (1905); Hand.-Mazz., Ann. Naturch. Mus. Wien (Pteridophyta u. Anthophyta aus Mesopotamien) 27 : 69 (1913); Nábělek, Publ. Fac. Sc. Univ. Masaryk, Brno (Iter Turc.-Persic.) 35 : 103

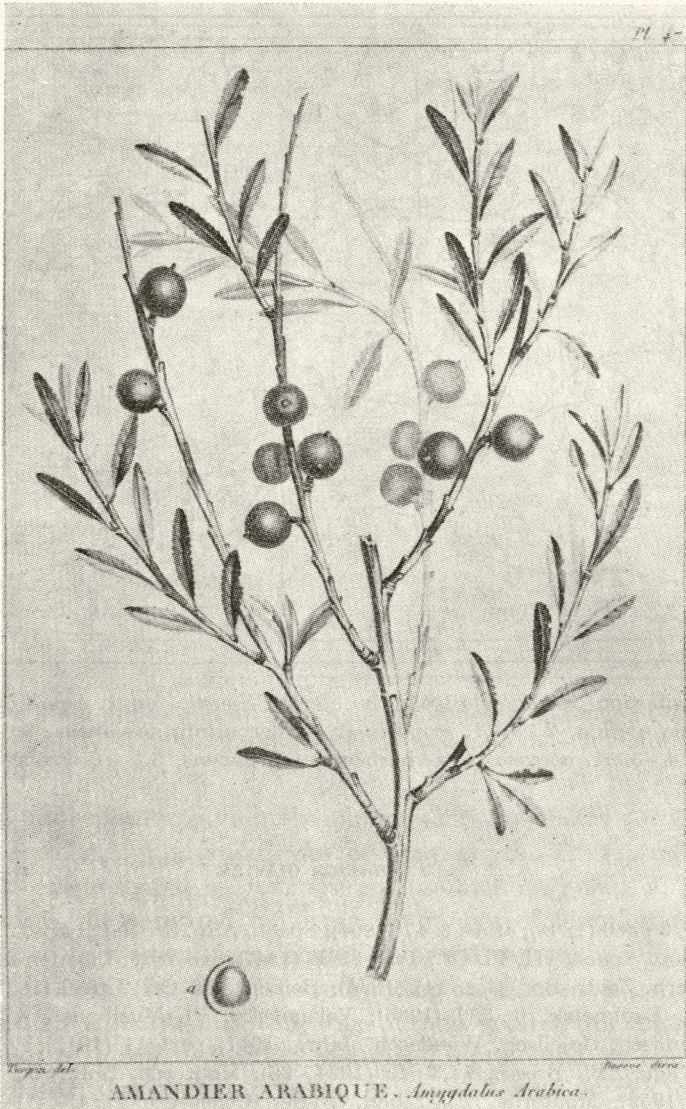


Fig. 3. The oldest illustration of *A. arabica* (Olivier, 1804, Atlas)

(1923) p. maxim. p.; Anthony, Not. R. B. G. Edinburg, 18: 288 (1935); Guest, Dep. Agr. Iraq Bull. 27: 78 (1933).

*A. spartioides* Spach. f. *oocarpa* Bornm., Beih. Bot. Centralbl. 58B: 252 (1938).

*Prunus arabica* (Oliv.) Meikle, Kew Bull. 19: 229 (1965); Meikle, in Fl. Iraq, 2: 157 (1966).

This first species of the section *Spartioides* has been usually described under the name *A. spartioides*. It has been found in western Iraq, near Anah on the Euphrat river and described by Olivier (1804), who has also published its first drawing (fig. 3) — a shoot with leaves and globular fruits. This shape of fruits is very rarely found in the genus *Amygdalus* and known only from a



Fig. 4. *A. arabica* var. *spartioides* (on the left) and *A. arabica* var. *arabica* (on the right) — differences in fruit shape are visible (Illustration from Jaubert et Spach, 1847 - 50, Illustrationes Plantarum orientaliu, vol. 3)

few species e.g. in *A. kuramica* Korsh. subsp. *kuramica* from Afghanistan. *A. spartioides* described 40 years later differs from typical *A. arabica* only and exclusively in the shape of fruits which are ovoid, distinctly longer than broader.

Looking through the herbarium material at my disposal, unfortunately not always represented by specimens with fruits, I was able to establish that globular or almost globular fruits occur in *A. arabica* only in a few cases. Besides on the basis of information in letters from Mr. R. D. Meikle from Kew, dated 30th December 1965 and 14th of January 1966 I know that one of Labillardière's herbarium specimen collected in Syria (Herb. Kew) has also "...subglobose or broadly fruits, like those of Bornmüller 1035". The remaining specimens are characterized by ovoid fruits. This difference in

fruit shape has been noticed earlier by Bornmüller (1938) and on this basis he has described a new form as *A. spartioides* f. *oocarpa* with fruits only slightly longer than broader. Both types of fruits are well illustrated (Plate 226) in the paper of Jaubert and Spach (1847 - 50) (fig. 4). Thus in spite of the fact that specimens with globular fruits are in *A. arabica* not numerous it seems justified to distinguish two varieties in the species:

a) *A. arabica* Oliv. var. *arabica*

Fruit globose or subglobose. In view of the rarity of this form representative herbarium sheets of it are listed below.

Kurdistania: Riwandous ad fines Pers., ad mont. Sakri-Sakran, ad pagum Galale, 900 m, 22. 6. 1893 c. fr., Bornmüller 1035 (JE.); in rup. calc. Mt. Avroman, Schahu, 5000', 1867 c. fr., Haussknecht (JE.); Circa Zebdaine prope Damascus. Summa juxta petrosa montis Garbi ornat, 5000', 6. 6. 1855 c. fr., Kotschy 72 (S.); Arar distr., As Sowwan, Lwejzo, 1909 c. fr., Musil 68 (P.R.C.).

b) *A. arabica* Oliv. var. *spartioides* (Spach) Browicz, stat. nov.

Syn.: *A. spartioides* Spach, Ann. Sc. Nat. Paris, 2 sér., 19:108 (1843).

Fruits ovoid, distinctly longer than broader. A variety common throughout the range of distribution of the species.

Geographical distribution: *A. arabica* occurs in Iraq (particularly in the northern part), in south-eastern Turkey, in Syria (very rare) in Lebanon and in western Iran (rare). According to Meikle (1966) it grows also in Jordan however I have not seen a single herbarium sheet from that country. Two herbarium specimens collected by Musil (No. 63 and 68) come from the Arar district and therefore presumably from the northern part of Saudi Arabia (fig. 1). In vertical distribution *A. arabica* occurs from 150 to 1650 m elevation, however it is most commonly found between 600 and 1200 m as can be judged from the available information. Concerning the ecological conditions under which *A. arabica* occurs the information is very scarce. The most detailed ecological characterization has been presented by Meikle (1966) for Iraq "Dry stony places on overgrazed eroded mountain slopes in open coppiced oak forest, or rocky limestones slopes and red marl banks; on sandstone slabs in the foot-hills — also in sandy places in wadi beds in the steppe and sub-desert". Meikle (l. c.) believes also that *A. arabica* has been devastated in parts of Iraq by "grazing and fuel-gathering". According to Guest (1966) in northern Iraq, west of the village Zawita, at an elevation of 900 - 1200 m above the sea level *A. arabica* is a part of an association *Anagyretum foetidae*, together with the following species of trees and shrubs: *Quercus brantii*, *Q. infectoria*, *Pinus halepensis* var. *brutia*, *Crataegus* and *Pistacia* sp., *Juniperus oxycedrus*.

2. *A. SCOPARIA* SPACH.

Ann. Sci. Nat. Paris, 2 sér., 19 : 109 (1843); Jaubert, Spach, Ill. Pl. Or., Tab. 227 (1847); Boissier, Buhse, Aufzaehlung: 79 (1860); Boissier, Fl. Or. 2 : 641 (1872); Bornmüller, Beih. Bot. Centralbl. 28, 2 : 225 (1911); Bornmüller, Beih. Bot. Centralbl. 32, 2 : 385

(1914); Woronow, Bull. appl. Bot. Genet. Pl. Breed. 14, 3 : 49(1924 - 25); Cavara, Nuov. Giorn. Bot. Ital. n. ser., 34, 5 : 1329 (1928); Popov, Bull. appl. Bot. Genet. Pl. Breed., 22, 3 : 370 (1928 - 29); Černiakovska, Bull. appl. Bot. Genet. Pl. Breed., 22, 5 : 192 (1929 - 30); Bornmüller, Beih. Bot. Centralbl. 58B : 252 (1938); Bornmüller, Beih. Bot. Centralbl. 59B : 294 (1939); Linčevski, Fl. URSS, 10 : 544 (1941); Parsa, Fl. Iran, 2 : 530 (1948); Blinovskij, Fl. Turkmen. 4 : 86 (1950); Kjøie, Reching, Dansk. Bot. Arkiv, 15, 4 : 38 (1954 - 55); Browicz, Fl. Iranica (manuscript, 1967).

Syn.: *Prunus scoparia* (Spach) Schneid., Ill. Handb. Laubholz. 1 : 590 (1905).

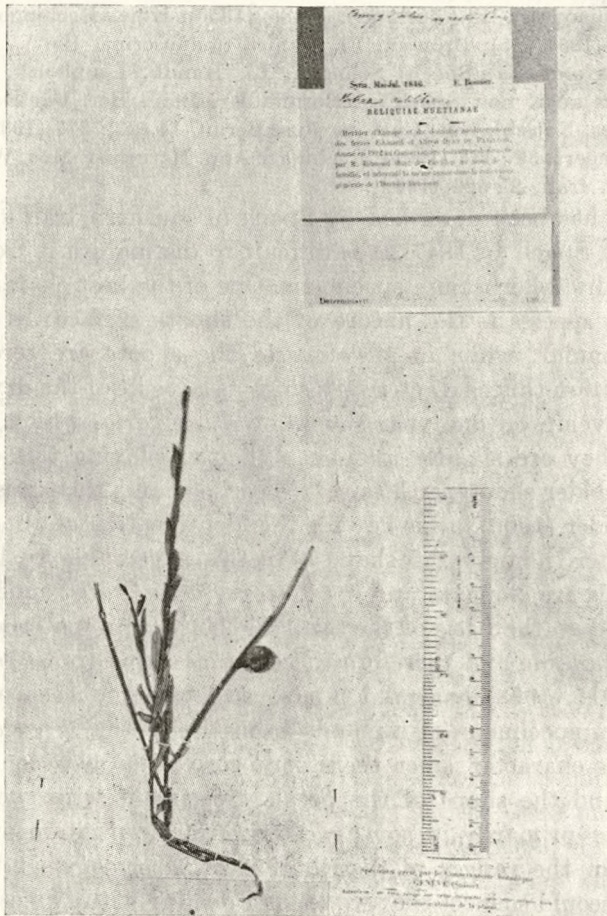
*A. spartioides* auct. non Spach — Bornmüller, Beih. Bot. Centralbl. 32, 2 : 384 (1914); Bornmüller, Notizbl. Bot. Gart. u. Mus. Berlin, 14 (23): 277 (1938); Bornmüller, Gauba, Feddes Repert. 39 : 117 (1935); Reching Ann. Naturhist. Mus. Wien, 53, 1 : 340 (1942); Parsa, Fl. Iran, 2 : 529 (1948).

This species has been described by Spach in southern Iran and illustrated by Jaubert and Spach in 1847. It is difficult to distinguish it from *A. arabica* on the basis of dried herbarium specimens. One of the best characters differentiating the two species is the nature of the shoots surface. In *A. arabica* it is distinctly angular, while in *A. scoparia* the shoots are terete. However in the dry condition this character fails since as a result of the drying longitudinal furrows develop on one year shoots of *A. scoparia*, which gives the impression that they are slightly angular. When employing this character one has to consider older shoots, at least two year old and then mistakes can be avoided. Schneider (1906) in his key for the identification of almonds has used another character, namely the shape of petals. According to his opinion in *A. arabica* petals are elongate and in *A. scoparia* they are roundish. However as can be judged on the basis of the available herbarium material the shape of petals is very variable and therefore the character appears to be of little use. Bornmüller (1911, 1938) has used it also and came to the conclusion that some herbarium specimens of almonds from the section *Spartioides* have as it were a double character, since there is no correlation between the nature of shoot surface and the shape of the petals. Specimens with such ill-matched characters occur primarily in south-western Iran, as it were on the zone of contact between the ranges of distribution of *A. arabica* and *A. scoparia*. As a result one could suspect that we are not dealing with two separate species but with two subspecies linked together by transitory forms. A clarification of this point could only be obtained after observations made in the field on living material.

A further character though of little use in the study of herbarium materials is the form of growth. *A. arabica* is an erect shrub 1 - 1.5 (2.5) m high while *A. scoparia* has a form of a tall shrub or a small tree and reaches even a height of 6 metres.

Geographical distribution: This is a subendemic species of Iran. It grows almost throughout Iran, particularly commonly in the south. On the basis of the data available it is absent from central Iran and particularly from the region of psammophilous and halophillous vegetation. Besides Iran it grows also in Turkmenia (USSR), in the Kopet-Dagh mountains, primarily in the region of Nokhur and Karakala. As distinct from *A. arabica* it occurs

primarily in the mountains, usually between 1200 and 2000 m elevation, and in southern Iran it has been even reported from 2700 m elevation (in sched., Bornmüller 3477, 3478, 3479). The lowest stand reported from Iran



Phot. K. Jakusz

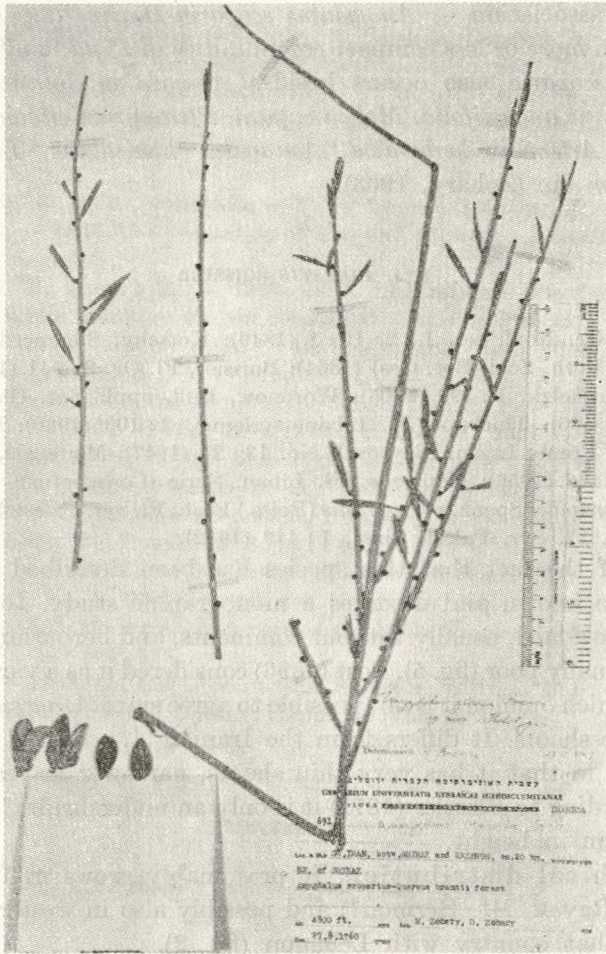
Fig. 5. A herbarium specimen of *A. agrestis* collected by Boissier (Conservatoire et Jardin botaniques, Genève)

is to be found at an elevation of 700 m. In the mountains of Kopet-Dagh *A. scoparia* behaves somewhat differently since it grows there at lower elevations, between 600 - 900 m (Blinovskij, 1950). One has to remember however that these are the most northerly stands of this almond species (fig. 2).

In Turkmenia *A. scoparia* occurs on dry stony mountain slopes and on bare soils (Popov, 1928 - 29; Linčevski, 1941) while in Iran on a plateau, on dry mountain slopes in valleys and river gorges, both on calcareous and on metamorphic substrata. Only Zohary (1963) gives some more details about the plant associations in which *A. scoparia* grows.



According to him in the southern and south-western part of the Zagrozan Forest District this almond forms a characteristic association — *Amygdaletum scopariae* accompanied by *Pistacia khinuk*, *Rhamnus persica* and *Ficus carica*



Phot. K. Jakusz

Fig. 6. *A. glauca* — holotypus (Department of Botany, Hebrew University, Jerusalem)

var. *rupestris*. With this association there are intermixed such species of trees and shrubs as: *Capparis spinosa* var. *pubescens*, *Ziziphus spina-christi*, *Z. nummularia*, *Periploca aphylla*, *Calotropis procera*, *Astragalus fasciculifolius*, *Lycium* (?) *barbarum* (between Kazerun and Shiraz). Further to the south east, about 100 km north of Bandar Abbas (stony wadi bed crossing plain) Zohary has recognized one further association — *Periploca aphylla*-*Amygdalus scoparia* growing together with the following species: *Dodonaea glabrescens*, *Astragalus fasciculifolius*, *Lycium barbarum*, *Amygdalus eburnea*, *Ziziphus*

*nummularia* var. *glabrescens*, *Ochradenus baccatus*, *Convolvulus leiocalycinus*, *Echinops kotschyi*, *Teucrium polium*, *Anvillea garcini*, *Cymbopogon schoenanthus*, *Platychaeta aucheri*. About 185 km south east of Kerman in the Jebel-Bariz Kuh range (near Asiab) on more elevated locations there has developed an association — *Amygdalus scoparia*-*Daphne angustifolia*. Above this association more or less compact communities of *Pistacia atlantica* develop in which *A. scoparia* also occurs besides *Amygdalus eburnea*, *Convolvulus bamensis*, *Daphne angustifolia*, *Melica cupani*, *Pteropyrum ericoides*, *Acantholimon stocksii*, *Artemisia herba-alba*, *Astragalus kuhistanus*, *Ebenus stellata*, *Acanthophyllum* sp. (Zohary, 1963).

### 3. *A. AGRESTIS* BOISSIER

Diagn. Pl. Or. Nov., ser. 1., 2, 10 : 1 (1849); Kotschy, Sommerflora Antilibanon u. Hermon: 21 (Verh. Zool.-Bot. Ges) (1864); Boissier, Fl. Or. 2 : 641 (1872); Schneider, Ill. Handb. Laubholz. 1 : 590 (1905); Woronow, Bull. appl. Bot. Genet. Pl. Breed., 14, 3 : 49 (1924 - 25); Thiebaut, Fl. Libano-syrienne, 2 : 100 (1940); Mouterde, Publ. Tech. Sc. Ecole Franc. Ingen., Beyrouth No. 13 : 25 (1947); Mouterde, Bull. Soc. Bot. France 106, 9 : 466 (1959); Mouterde, Fl. Liban, Syrie (Conspectus): 43 (1965).

Syn.: *A. spartioides* Spach. var. *agrestis* (Boiss.) Post., Fl. Syr. Palest. Sinai: 302 (1896); Post, Dinsmore, Fl. Syr. Palest. Sinai, 1 : 449 (1932).

In spite of the fact that this species has been described 120 years ago it is still little known and deserves a monographic study. In the literature it is rarely mentioned, usually without comments, and herbarium collections of it are exceptionally poor (fig. 5). Post (1896) considered it as a variety of *A. spartioides* with which opinion it is not possible to agree since *A. agrestis* is characterized by terete shoots. It differs from the Iranian *A. scoparia* which has also terete shoots, in that it has very thin shoots, narrower leaves and a poorer growth. According to Boissier (1872) it is only an undershrub (?) which attains only 30 - 60 cm in height.

Geographical distribution: It presumably grows in Lebanon (Baalbeck, Zahle, Rayak, Mt. Hermon?) and possibly also in western Syria on the boundry of that country with Lebanon (fig. 2).

### 4. *A. GLAUCA* BROWICZ

Fl. Iranica (manuscript, 1967).

A species so far known only from one stand in southern Iran (between Shiraz and Kazerun, ca. 20 km NE of Shiraz), where it grows in the forests of *Quercus brantii* at an elevation of about 1600 m above the sea level (fig. 1). As distinct from other species of section *Spartioides* it is characterized by a bluish pigmentation of shoots and leaves, bluish-brown fruits, white puberulent, with narrowly-ovate, acute stones, only slightly compressed (fig. 6). Similarly as *A. scoparia* which occurs also in the vicinity of Shiraz it has terete shoots.

## LITERATURE

1. Blinovskij K. V. — 1950, *Amygdalus* L. in Flora Turkmenii 4 : 82 - 87, Ašchabad.
2. Boissier E. — 1849. Diagnoses Plantarum orientalis novarum, Ser. 1., 2, 10, Lipsiae et Parisiis.
3. Boissier E. — 1872, Flora Orientalis, 2, Basileae, Genevae, Lugundi.
4. Bornmüller J. — 1911. Collectiones Straussianae novae. Weitere Beiträge zur Kenntnis der Flora West-Persiens. Beih. z. Botan. Centralbl. 28, 2 : 225 - 267.
5. Bornmüller J. — 1938. Iter Persico-turcicum 1892 - 1893. Beiträge zur Flora von Persien, Babylonien, Assyrien, Arabien (Fortsetzung II), Beih. z. Botan. Centralbl. 58B : 252 - 302.
6. Browicz K. — 1967. *Prunoideae* in Flora Iranica (manuscript).
7. Guest E. R. — 1966. The vegetation of Iraq and adjacent regions, in Flora of Iraq, 1 : 55 - 108, Baghdad.
8. Jaubert H. F., Spach E. — 1847 - 1850. Illustrationes Plantarum orientalis (Choix de Plantes nouvelles ou peu connues de l'Asie occidentale), 3, Paris.
9. Linčevski I. A., Fedorov A. A. — 1941, *Amygdalus* L. in Flora URSS 10 : 522 - 547, Moskva—Leningrad.
10. Meikle R. D. — 1965. Contributions to the flora of Iraq: I., Kew Bull. 19, 2 : 229 - 230.
11. Meikle R. D. — 1966. *Prunus* L. in Flora of Iraq, 2 : 153 - 170, Baghdad.
12. Olivier G. A. — 1804. Voyage dans l'empire Othoman, l'Égypte et la Perse, fait pendant les six premières années de la republicue, 3, Paris.
13. Popov M. G. — 1928 - 29. Wild growing fruit trees and shrubs of Asia Media, Bull. appl. Bot. Genet. Pl. Breed. 22, 3 : 241 - 483.
14. Post G. E. — 1896. Flora of Syria, Palestine and Sinai, Beirut.
15. Schneider C. K. — 1906. Illustriertes Handbuch der Laubholzkunde, 1, Jena.
16. Spach E. — 1843. Monographia generis *Amygdalus*, Annales des Sciences naturelles, Paris, 2 série, 19 : 106 - 128.
17. Zohary M. — 1963. On the Geobotanical Structure of Iran, Bull. of the Research Counc. of Israel, Sect. D., Botany, Suppl. to Vol. 11 D.

KAZIMIERZ BROWICZ

*Migdały z sekcji Spartioides Spach.*

## Streszczenie

Sekcja *Spartioides* liczy obecnie 4 gatunki: *Amygdalus arabica* Oliv., *A. scoparia* Spach, *A. agrestis* Boiss. i *A. glauca* Browicz. Jest to wybitnie kserofityczna grupa gatunków charakteryzujących się prętowatymi, zielonymi pędami oraz wczesnym opadaniem liści (w lecie). Wszystkie gatunki tej sekcji są do siebie bardzo podobne, to też zarówno w literaturze, jak i w zbiorach zielnikowych są często mylnie określane. Przeważnie wymieniane są tylko dwa gatunki — *A. arabica* (najczęściej pod nazwą *A. spartioides* Spach) oraz *A. scoparia*, które też rozprzestrzenione są na znacznym obszarze, podczas gdy pozostałe dwa gatunki należą do lokalnych endemitów, znanych tylko z kilku stanowisk względnie nawet z jednego stanowiska.

Autor na podstawie bogatych zbiorów zielnikowych (ponad 180 arkuszy) pochodzących z głównych zielników europejskich, opracował punktowe mapy zasięgów poszczególnych gatunków. W opracowaniach tych wykorzystał także dane z literatury, jednak tylko w nieznacznym stopniu.

1. *A. arabica* — występuje w Libanie, Syrii, południowej Turcji i w północnym Iraku, na wysokości od 150 - 1650 m n. p. m. Można u niego wyróżnić dwie odmiany: var. *arabica* — o kulistawych owocach i var. *spartioides* (Spach) Browicz o owocach jajowatych, wyraźnie dłuższych jak szerokich. Pierwsza z tych odmian, jak się wydaje, jest bardzo rzadka, znana jak dotąd tylko z kilku stanowisk.

2. *A. scoparia* — występuje w ZSRR w górach Kopet-Dagh (Turkmenia) oraz w Iranie między 600 - 2700 m n. p. m. Gatunek ten jest trudny do odróżnienia od poprzedniego, przynajmniej w zbiorach zielnikowych. Przy określaniu mogą być wykorzystane, właściwie biorąc, tylko dwie cechy:

a) powierzchnia pędu — u *A. scoparia* pędy są obłe, a u *A. arabica* kanciaste. Cechę tą należy jednak przede wszystkim rozpatrywać na pędach dwuletnich i starszych; w przypadku suchych zbiorów zielnikowych pędy jednoroczne u *A. scoparia* mogą być jak gdyby nieznacznie kantowate.

b) forma wzrostu — *A. scoparia* jest wysokim, wyprostowanym krzewem lub małym drzewem dorastającym do 6 m; *A. arabica* to krzew o wysokości co najwyżej 2,5 m.

Nie jest wykluczone, że w przyszłości, przy bardziej dokładnych obserwacjach przeprowadzonych na świeżym materiale będzie można te dwa gatunki uznać jedynie za podgatunki; jak się wydaje formy przejściowe między nimi występują w południowo-zachodnim Iranie.

3. *A. agrestis* — znany jest tylko z Libanu. Zagadkowy i mało jeszcze zbadany gatunek o cienkich i obłych pędach.

4. *A. glauca* — jak dotąd znany tylko z południowego Iranu, z okolic Shiraz. Charakteryzuje się sinymi pędami i liśćmi oraz sinobrazowymi, biało owłosionymi owocami.

#### КАЗИМЕЖ БРОВИЧ

### *Миндали из секции Spartioides Spach.*

#### Резюме

Секция *Spartioides* насчитывает в настоящее время четыре вида: *Amygdalus arabica* Oliv., *A. scoparia* Spach, *A. agrestis* Boiss., *A. glauca* Browicz. Это отчетливо ксерофитная группа видов, характеризующихся зелеными прутевидными побегам и ранним летним опадением ланцетовидных листьев. Все виды очень схожи друг с другом, и поэтому в литературе и в Гербариях их часто ошибочно определяют. Чаще всего упоминаются только два вида: *A. arabica* (обычно под названием *A. spartioides* Spach) и *A. scoparia*, распространенные на обширной территории, в то время как два других относятся к эндемам, известным с нескольких или даже с одного местонахождения.

Автор на основе богатых гербарных сборов (свыше 180 листов) из главнейших европейских гербариев составил точечную карту ареалов этих видов. При этом, хотя и в незначительной степени, были использованы литературные данные.

1. *A. arabica* распространен в Ливане, Сирии, южной Турции, Ираке и в западном Иране на высотах 150—1650 м над ур.м. Можно выделить две его разновидности: var. *arabica* (с шаровидными плодами) и var. *spartioides* (Spach) Browicz (с яйцевидными плодами, у которых длина существенно превышает ширину). Первая разновидность, по-видимому, очень редкая; она до сих пор известна из нескольких пунктов.

2. *A. scoparia* распространен в Туркменской ССР (Копет—Дар) и в Иране (на высотах 600—2700 м над ур. м.). Этот вид с трудом отличается от первого (во всяком случае, в гербариях). При их разделении можно использовать, собственно говоря, только два признака:

а) Форма побега — у *A. scoparia* они в разрезе округлые, у *A. arabica* — четырехгранные. Этот признак хорошо проявляется у двулетних и многолетних побегов, у однолетних же (в гербарных сборах) побегов *A. scoparia* может наблюдаться нечетко выраженная четырехгранность.

б) Форма роста — *A. scoparia* — высокий прямостоящий кустарник или небольшое дерево, до 6.0 м в высоту; *A. arabica* — кустарник, достигающий 2.5 м.

Не исключено также, что в будущем, на основе более детального изучения живых растений, эти два вида будут отнесены к рангу подвидов. Переходные формы между ними имеются, по-видимому, в юго-западном Иране.

3. *A. agrestis* известен только из Ливана. Загадочный и плохо изученный вид с тонкими округлыми побегами.

4. *A. glauca* известен до сих пор только из южного Ирана (окрестности Шираза). Характеризуется синими побегами и листьями и сине-коричневыми плодами с белым опушением.



Fot. K. Jakusz

*Pinus contorta* Loud. — kwiaty żeńskie