

Characterization of areas

Rosaceae

Amelanchier Medicus

1. *Amelanchier ovalis* Medicus

Syn.: *A. vulgaris* Moench, *A. rotundifolia* (Lam.) Dum.-Cours.

Erect or spreading shrub 1 - 3 m tall with thin, thin twigs, giving a characteristic almond odour when crushed. This species is very variable in size and shape of leaves and in the persistence of pubescence on the dorsal side. It has been split into three subspecies, the type subsp. *ovalis* with ovate or ovate - oblong leaves occurring almost throughout the range of the species, subsp. *cretica* (Willd.) Maire et Petitm. with orbicular leaves occurring in Greece and subsp. *integrifolia* (Boiss. et Hohen.) Bornm. with leaves having entire margins occurring in Anatolia, Iraq and on a single stand in Greece.

The main part of the range of *A. ovalis* covers southern and central Europe, where in the northerly direction the species reaches as far as Luxemburg. Besides it grows also in northwestern Africa, in Anatolia, on the Caucasus, in northeastern Iraq (here very rare) and even in northern Lebanon. In the latter country it is represented by a special variety, var. *libanotica* Browicz. It occurs in montane forests of various type, but as a rule in such places where a larger amount of light reaches the forest floor, that is in forest openings, on exposed limestone rocks and on stony slopes, singly or in small groups. On more elevated stands it enters into low thickets. It is a light requiring species moderately mesophyllic.

In its vertical distribution it appears as a rule at elevations above 1000 m and up to 1800 m. In Bulgaria it grows between 600 and 1900 m, in Romania between 1600 and 2000 m, in Iraq between 1500 and 1900 m, and in Greece and Anatolia between 400 and 2200 m. The elevational maximum is attained in the Atlas Mts. in Morocco at 2800 m.

A. ovalis is a valuable ornamental shrub popularly planted in parks, frequently in the form of groups or hedges.

References: 64 (4), 103 (5), 104 (4), 138, 156, 163 (2), 218 (2), 228 (2), 420.

2. *Amelanchier parviflora* Boiss.

Syn.: *A. pisidica* Boiss. et Heldr.

A shrub 2 m tall with thin shoots and small, 1 - 2 cm long leaves, with entire margins or only serrate at the tips, persistently white-tomentose beneath.

It is an eastern Mediterranean species with a relatively compact limited range restricted only to southwestern Anatolia. It occurs on relatively few stands in province of Manisa, Izmir, Uşak, Mugla, Denizli, Bodrum,

Isparta, Antalya and İçel, and also after a larger disjunction in province of Kayseri. Recently it has also been found on the Greek island Samos, on Mt. Kerki.

A. parviflora grows in open coniferous forests of pine, cedar and juniper and also among thickets on limestone rocks together with species belonging to maquis, usually between 900 and 1500 m, rarely higher as on Teke Dag in Antalya province where it has been found up to 2000 m. On Samos Is. it occurs more or less from 600 - 800 m to the mountain top - 1433 m.

References: 64 (4), 156, 420.

Amygdalus L.

3. *Amygdalus arabica* Olivier

Syn.: *A. spartioides* Spach, *Prunus arabica* (Olivier) Meikle, *Prunus spartioides* (Spach) C. Schneider

An erect, densely branched shrub characterized by having stiff permanently green, glabrous and angled shoots, and being up to 1.5 - 2.5 m tall. For the most part of the year the shrubs are leafless, since sparse foliage appears only on the youngest shoots which are soon deciduous. In its appearance *A. arabica* resembles to a considerable degree the Mediterranean shrub *Spartium junceum* L.

It is a western Irano - Turanian species. Its range covers primarily southeastern Anatolia, Iraq and Syria. Single stands are known also from western Iran, Jordan and northern Saudi Arabia. The occurrence of *A. arabica* in Lebanon is not quite clear. It has been sometimes reported from there, however, there grows a closely related almond species, *Amygdalus agrestis* Boiss which sometimes is considered to be its variety. Thus in the north the limit of the range only slightly extends beyond 38° Lat. and in the south beyond 31° Lat. The further south one goes the more rare are the stands and more scattered but they are represented by very numerous specimens.

A. arabica inhabits dry, bare, rocky limestone and sandstone cliffs, stony slopes, both in lowland and hilly countryside. On the one hand, it enters open, degraded oakwoods in the north and on the other, forest-steppe, steppe and subdesert communities in the south. It appears also in sandy places in wadi beds. In places it occurs very abundantly forming its own very characteristic association - *Amygdaletum arabicae*. In its vertical distribution it has little elevational differentiation. In Anatolia it grows between 600 and 1200 m, in Iran between 150 and 1370 m and in the mountains of western Syria near Zebdani it attains even 1520 m.

The fruit of *A. arabica* (almonds) are locally eaten, and the branches are used as firewood in treeless regions where other fuel is scarce.

References: 51, 64 (4), 163 (2), 228 (2), 259 (2), 418, 424, 429, 452.

4. *Amygdalus browiczii* Freitag.

A small unarmed tree up to 5 m tall. The species is little known yet, described only in 1972. It is closely related to *Amygdalus communis* L. It can be treated as a vicariant species for *Amygdalus kuramica* Korsh. occurring in eastern Afghanistan.

A. browiczii is an Irano-Turanian montane species, restricted in its range to eastern Afghanistan from where it has been reported from only a few stands in provinces Farah and Hilmand. It grows there together with *Pistacia atlantica* Desf. forming jointly, loose, park-type aforestations. In its vertical distribution it appears between 1300 and 2900 m, usually, however, between 1600 and 2700 m.

References: 423, 433.

5. *Amygdalus bucharica* Korsh.

Syn.: *Prunus bucharica* (Korsh.) Hand.-Mazz.

An erect shrub 1.5 - 4 m tall or a small tree with several stems up to 6 - 7 m tall and in extreme cases even 9 m tall. Old specimens with a single stem diameter up to 30 - 35 cm branch out about 1 - 1.5 m and grow to live about 70 years. It is a very variable species in the pubescence of twigs and leaves, in the size and shape of leaves and in the sculpturing of the stone surface. More pubescent forms appear to be more common in the southern part of the range and are described as var. *incana* Popov. In western Tyan Shan and in western Pamir-Alai Mts. *A. bucharica* forms natural hybrids with *Amygdalus spinosissima* Bunge (*A. x saviczii* Pachom.).

The range of *A. bucharica* is very similar to the range of *Pyrus korshinskyi* Litv. and these two species frequently grow with each other in one and the same stand. The main part of the range lies in the Soviet republics of Middle Asia, particularly in Tadzhikistan and southern Uzbekistan. Besides this species is known also from southern Kirgiziya and from southeastern Turkmeniya, distr. Karlyuk, from the mountains of Kugitangtau bordering on Uzbekistan. In the north *A. bucharica* reaches Khrebet Nuratau in Uzbekistan and Khrebet Ferganskij in western Tyan Shan (Kirgiziya). On the other hand, in the south it appears in northern Afghanistan in province of Mazar-i-Sharif, Kataghan and Badakhshan, more or less up to 36° Lat. N. It appears now that it is more common here than it used to be thought on the basis of data that was available so far.

A. bucharica is a light requiring species, resistant to drought. It grows primarily on stony, sandy and loess slopes and on rocks, and also in dry valleys, usually singly or in small groups together with other xerothermic trees and shrubs rarely forming its own pure communities. It is usually accompanied by *Celtis caucasica* Willd., *Acer pentapomicum* J. Stewart and *A. turkestanicum* Pax, *Juniperus seravschanica* Komarov, *Pyrus korshinskyi* Litv. and *P. regelii* Rehder, *Pistacia vera* L. and species from the genera *Cerasus*, *Lonicera*, *Berberis*, *Cotoneaster*, *Crataegus* and *Rhamnus*. In southern Tadzhikistan it appears already at an elevation of 600 - 700 m but is most common between 1000 and 1800 m. In Kirgiziya it attains even an elevation of 2200 m and in Tadzhikistan 2500 - 2600 m. On the other hand, in Afghanistan it has been reported from elevations between 500 and 1780, and only in the province Badakhshan it has been found at 2400 m.

Fruit of *A. bucharica*, as distinct from fruit of *Amygdalus communis* L. do not have any economic significance, however, locally they are consumed and used for medical and cosmetic purposes. In fruit-farming *A. bucharica* is sometimes used as stocks for the sweet almonds and peaches. Besides, thanks to the strong and superficial root system *A. bucharica* may be used for the consolidation of devastated, dry, moving slopes.

References: 51, 177 (4), 252, 397, 435, 439, 440, 447.

6. *Amygdalus carduchorum* Bornm.

Syn.: *Prunus carduchorum* (Bornm.) Meikle

A small, erect or spreading subsppinescent shrub, 0.5 - 1 m tall with slender twigs and narrow, lanceolate or linear leaves with entire or serrate margins.

It is an Irano-Turanian species known only from coastal regions of Anatolia and Iraq and from north-eastern Iraq and western Iran. Furthest to the north it grows in the Anatolian province of Hakkari, on Cilo Daği, and furthest to the south in the Avroman Mts. in Iraq. It occurs on few stands, usually in the upper parts of the mountains, usually above 2000 m elevation, on slopes of river and stream valleys, or on rocky slopes and screes, in open places or in degraded oak forests. In Anatolia it has been found at an elevation of 2300 - 2500 m, in Iraq between 1500 and 3000 m and in Iran between 1800 and 2100 m.

References: 51, 64(4), 228(2), 424.

7. *Amygdalus fenzliana* (Fritsch) Lipsky
Syn.: *Prunus fenzliana* Fritsch

A subsperescent shrub, usually 2 - 3 m tall, more rarely a small tree up to 4 m tall. In favourable conditions it can attain even larger dimensions as far as for example in Armeniya, in the valley of the river Cav where a whole population of tree specimens (more than 1200 individuals) were observed, 3 - 6 m tall and with a stem diameter of 20 - 44 cm, with large fruits. It is not unlikely that they represent some unidentified hybrids of this species with *Amygdalus communis* L. Besides variability of dimensions *A. fenzliana* is also characterized by a considerable diversity in fruit size, stone wall thickness and the extent of spinescence.

It is a Caucasian species. On the Caucasus its range is restricted primarily to regions located south of Sewan lake in Armeniya and Azerbaydzhan. More rarely it grows north of this lake. Besides, though much more rarely it grows in northeastern and eastern Anatolia and in northwestern Iran. It grows primarily on dry, insolated, stony and rocky slopes, in xerophytic, sparse forests and in forest-steppe and steppe communities. In the latter case it grows together with *Stipa* grasses. In places it can form its own, almost pure, thickets however, most commonly it is to be found together with *Rhamnus pallasii* Fischer et C. Meyer, *Paliurus spina-christi* Miller, *Jasminum fruticans* L., *Acer monspessulanum* L. (s.l.), and species from the genera *Rosa*, *Celtis*, *Pistacia*, *Spiraea* and *Juniperus*.

On the Caucasus it is usually distributed between 800 and 1600 - 1700 m elevation, however, in the valley of the river Arpa (western Armeniya) it reaches even up to 2100 m, but then only in the form of low shrubs, scarcely 80 cm tall. Iranian stands are located between 1300 and 1800 m and the Anatolian ones between 700 and 1800 m.

References: 51, 64(4), 103(5), 104(4), 423, 424, 430.

8. *Amygdalus graeca* Lindley

Syn.: *A. discolor* (Spach) Roemer, *Prunus discolor* (Spach) C. Schneider

A spinescent shrub, 1 - 2 m tall or a small tree (3 - 4 m) resembling *Amygdalus orientalis* Duhamel in growth form and previously considered only to be its variety (*Amygdalus orientalis* Duhamel var. *discolor* Spach). However, it differs from that almond primarily in having glabrous dorsal leaf surface. On Rodhos Is. it forms spontaneous hybrids with cultivated forms of *Amygdalus communis* L. described as *Amygdalus × rhodia* Browicz.

The range of *A. graeca* is divided into two basic parts. The first one, much richer in stands, covers southwestern Anatolia and some adjacent Greek islands, Rodhos and Kalimnos. The latter part with scarcely a few stands lies in the region of northwestern Syria (near Aleppo). Besides on isolated stand separated from these two regions it is known to occur near Ankara (Çubuk Dam).

A. graeca is a light requiring, xerophyllic shrub occurring on rocky, calcareous slopes, primarily in phrygana. Occasionally it occurs also in very sparse pinewoods (*Pinus brutia* Ten.). In places (in Anatolia), it grows together with *Amygdalus orientalis* Duhamel, it is, however, much less common and located of somewhat lower elevations, between 10 and 500 m.

References: 64(4), 422, 424.

9. *Amygdalus haussknechtii* (C. Schneider) Bornm.

Syn.: *Prunus haussknechtii* C. Schneider

Widely branched, dense, spinescent shrub or a small tree. The species in spite of being known already from the beginning of 20-th c. is still little studied. In some studies, particularly older ones, it is confused with *Amygdalus webbii* Spach, and is erroneously reported under that name. It is characterized by consi-

derable variability in the degree of pubescence of leaves as a result of which two varieties are recognized within it: 1. var. *haussknechtii* — leaves glabrous on both surfaces, and 2. var. *pubescens* (Bornm.) Bornm., leaves more or less pubescent.

Most probably it is an Iranian endemite, though possibly it grows also in northeastern Iraq, though the information from that region is not clear and requires verification. In Iran it occurs only on a small region including western provinces of the country namely: Kermanshah, Isfahan, Bakhtiari and Luristan, more or less between 32° and 34° Lat. N.

It occurs in mountains, usually between 1600 and 2800 m, however, its elevational minimum (Shah Bazan) is 1200 m and the maximum (Damaver) is 3600 m. Closer information about its ecological requirements are lacking, however, it is known that it has been found in destroyed oakwoods (*Quercus brantii* Lindley) on limestone substratum.

References: 51, 423.

10. *Amygdalus kotschyi* Boiss. et Hohen.

Syn.: *Prunus kotschyi* (Boiss. et Hohen.) Náb.

A small, subspinescent, much branched, prostrate or suberect shrub scarcely 30 - 45 cm tall. It is characterized by a very dense, soft, long, yellowish-grey indumentum of shoots, leaves and fruits. In the initial stages of its development the indumentum is silvery.

It is an Irano-Turanian species. Its range is restricted primarily to the montane massif of Zagros in Iran and in Iraq. It is known also from only two stands in southern Anatolia. It grows on limestone rocks, boulders and screes, on dry and open places in the upper margins of oak or pistacia forests, and also in thorny thickets of high mountain shrubs. It is usually associated with higher locations, between 1800 and 2500 m. At lower elevations it appears only sporadically, down to 1220 m in Iran, 1400 in Anatolia and 1500 m in Iraq.

A. kotschyi forms hybrids with *Amygdalus communis* L. (*Amygdalus* × *sefinensis* Bornm) reported from Iraq and probably also with *Amygdalus haussknechtii* (C. Schneider) Bornm. from Iran.

References: 51, 64(4), 424.

11. *Amygdalus kuramica* Korsh.

Syn.: *Prunus kuramica* (Korsh.) Kitam.

An erect shrub or a small tree up to 4 - 5 m tall. This species is closely related to *Amygdalus communis* L., from which it differs in having distinctly smaller (at least by a factor of two) drupes, and thinner, virgate branches.

It is represented by two subspecies subsp. *kuramica* and subsp. *aitchisonii* (Korsh.) Browicz which differ from each other in the size and degree of flattening of the drupes and in the sculpturing of the stone surface. Subsp. *aitchisonii* which has larger fruits and more deeply sulcate stones is possibly a hybrid between *A. kuramica* and peach (*Persica vulgaris* Miller). In Afghan Hindukush, in Andarob region, *A. kuramica* forms spontaneous hybrids with *Amygdalus spinosissima* Bunge, described as *Amygdalus* × *andarobii* Seraf.

This almond, besides *Amygdalus bucharica* Korsh., belongs to the most easterly species from section *Amygdalus*. Its range lies in eastern Afghanistan and in most westerly Pakistan and is restricted within the relatively narrow boundaries 67 - 72° Long. E and 33 - 36° Lat. N. As can be judged from the data available so far it occurs most commonly in Afghanistan, in Nuristan and in the vicinity of Kabul, while in Pakistan it is rare, known only from Chitral and in the western part of Kurram Valley close to the Afghan frontier.

A. kuramica grows scattered, particularly in river valleys on rocky or gravelly, usually steep slopes of northwestern, western and southern exposition, in open and insolated places, and also in sparse oakwoods

(*Quercus baloot* Griffith). In Afghanistan it appears already from 1000 - 1100 m elevation, usually, however, above 1600 m and as high up as 2850 m. In Pakistan it has been reported from elevations between 1900 and 2800 m.

It is unknown in cultivation.

References: 51, 390, 433, 435, 445.

12. *Amygdalus orientalis* Duhamel

Syn.: *A. argentea* Lam., *Prunus orientalis* (Duhamel) Koehne, *Prunus argentea* (Lam.) Rehder.

It is a much branched from the very ground, subspinescent shrub, 1 - 2(3) m tall, characterized by having white tomentose shoots, leaves and fruits, primarily young ones. The latter are very variable in size and shape. Specimens with larger (up to 3 cm) and much flattened fruits appearing in the southern part of the range are described as subsp. *mesopotamica* Browicz. In Anatolia *A. orientalis* forms spontaneous hybrids with *Amygdalus communis*, known under the name of *Amygdalus* × *balansae* Boiss.

It is an Irano-Turanian species, in places extending into adjacent Mediterranean territories. Its range covers primarily the southern and central Anatolia and northeastern Iraq where it is one of the most common almonds and in places it can be the dominating element as for example in the vicinity of Ankara. Besides it grows in the Iranian Kurdistan, in western Syria and in Lebanon, attaining its southern extremity in northern Israel, in Upper Galilee.

A. orientalis grows primarily in open regions, insolated and warm, singly or in smaller or larger groups, on sandy, steppe or forest-steppe hills, on loose-gravell ground, on rocky limestone slopes and cliffs, frequently with species from the genus *Pistacia* and *Crataegus*. It enters also into natural hedges on field boundaries, representing a remnant of the destroyed arboreal vegetation. Such hedges are known from northwestern Syria and southeastern Anatolia (eg. near Gaziantep).

In its vertical distribution *A. orientalis* appears most commonly at lower mountain elevations between 600 and 1200 m. In Anatolia it grows between 360 and 1600 m, in Iraq between 500 and 1100 m, however, in the Iraqi-Iranian border, in the Avroman Mts. and in Iran it attains an elevation of 1800 - 2000 m.

References: 51, 64(4), 163(2), 228(2), 259(2), 422, 424.

13. *Amygdalus scoparia* Spach

Syn.: *Prunus scoparia* (Spach) C. Schneider

A strong erect shrub up to 3 - 4 m tall (sometimes even taller), resembling in morphological characters and form of growth *Amygdalus arabica* Olivier with which species it is sometimes mistaken or identified. Stems of old specimens can be as thick as arm. *A. scoparia* forms natural hybrids with *Amygdalus lycioides* Spach (*A.* × *keredjensis* Browicz) and with *Amygdalus elaeagnifolia* Spach (*A.* × *podperae* (Náb.) Woronow).

It is an eastern Irano-Turanian species, replacing *Amygdalus arabica* Olivier in this region. Its range covers almost the whole Iran except for the northwestern part. Besides it is also known from Turkmeniya, from the central Kopet Dag Mts. and from one stand in northwestern Afghanistan, from province Firozkoh. Recently it has been found also on the Arabian peninsula in Oman, on Jabal Harim.

A. scoparia is a distinctly xerophyllic species, occurring on the driest and hottest sites, the majority of its stands occurring in the southern part of its range. It grows on loose conglomerate and limestone cliffs, on soft basalt, in cervices, on stony and pasture slopes, and sandy and clayey soils, usually in smaller or larger groups. It frequently accompanies devastated open forest-steppe communities, resembling savannas in appearance and having such tree species as *Pistacia atlantica* Desf. and *Pistacia khinjuk* Stocks and such shrubs as *Periploca aphylla* Decne., *Dodonea viscosa* (L.) Jacq., *Daphne mucronata* Royle and very thorny almonds from the subgenus *Dodecandra* (Spach) Browicz. It appears also in steppe and semidesert com-

munities, where besides herbaceous plants only small sub-shrubs from the genus *Artemisia* and *Pteropyrum* and thorny *Astragalus* occur. Similarly as *Amygdalus arabica* Olivier it can be a dominant species and it can form its own association — *Amygdaletum scopariae*.

In contrast to *Amygdalus arabica* Olivier it occurs most commonly above 1200 m elevation, particularly in the south. The most elevated stands are known from mountains in the region of Kerman and Yazd at 2700 m. In the north and west of the range it can be found lower, e. g. in Turkmeniya between 400 and 900 m.

References: 51, 418, 429, 445.

14. *Amygdalus trichamygdalus* (Hand.-Mazz.) Woronow

Syn.: *Prunus trichamygdalus* Han.-Mazz.

Unarmed shrub up to 3 m tall or a small tree. A species closely related to *Amygdalus communis* L., differing from it in having smaller leaves and very short petioles (up to 4 mm).

A. trichamygdalus grows primarily in eastern Anatolia, only on few, scattered stands in province of Marash, Elazig, Bitlis, Hakkari and Erzincan. It has usually been found on rocky limestone slopes of gorges at 1250 - 1900 (2100) m elevation. Besides, a most southerly stand occurs in Iranian Kurdistan at about 1600 m elevation.

The species is insufficiently known as yet.

References: 64(4), 107, 424.

15. *Amygdalus webbii* Spach

Syn.: *A. salicifolia* Boiss. et Bal., *Prunus webbii* (Spach) Vierh.

A strong thorny, wide-spreading shrub, giving root suckers and attaining a height of 2 - 3 m. When older frequently with several stems or even with only one up to 5 - 6 m tall and a diameter of up to 25 - 30 cm. It is a very variable species in terms of leaf length and width, which is probably conditioned by site factors. Smaller and narrower leaves occur in individuals that grow on drier places.

It is a Balkano-Anatolian species. In Europe it occurs primarily on the Balkan Peninsula, and particularly in southern Yugoslavia (Macedonia), in continental Greece, in Albania and on Crete. It is also known from one stand in southwestern Bulgaria. Furthest to the west it reaches southern Italy and eastern Sicilia. The Asiatic part of the range covers western Anatolia where the further one goes eastwards the less commonly it occurs and the stands are more sparse. Here the almond reaches eastwards to more or less 34° Long. E, in province of Kastamonu, near Tosya. Recently it has also been discovered on Rodhos Is.

A. webbii grows in open insolated places, on poor soils, on rocky limestone or gravelly slopes, usually no further up than to 900 - 1000 m. From Yugoslav Macedonia it has been reported also up to 1150 m, from Anatolia up to 1200 m and from Greece in Epiros in the Timphi mountains even up to 1200 - 1600 m. It occurs most commonly with other xerothermic shrubs with deciduous leaves, in shiblyak type communities or in strongly opened, degraded oakwoods, and also in devastated communities of phrygana, and more rarely in low maquis, in places forming its own pure communities, e.g. near Mykene on the Peloponnisos.

This species is sometimes used as stocks for the grafting of cultivated varieties of *Amygdalus communis* L., and even for peach (on dry chalky areas).

References: 64(4), 78, 79, 423, 424, 428, 438, 450.

16. *Cerasus angustifolia* (Spach) Browicz

Syn.: *C. araxina* Pojark.

An erect shrub usually 1 - 1.5 m tall, sometimes taller, with thin shoots having narrow lanceolate leaves 5 - 8 times as long as broad, characteristically positioned almost parallel with the shoot. The leaves are very variable in pubescence of the dorsal side, and sometimes on one and the same location one can find individuals which have pubescent leaves (var. *angustifolia*), or completely glabrous ones (var. *sintenisii* (C. Schneider) Browicz). The species is closely related to *Cerasus incana* (Pallas) Spach and initially it has been even described as its variety (*C. incana* var. *angustifolia* Spach). However, it differs clearly from *Cerasus incana* (Pallas) Spach in the breadth and length of leaves which are revolute. If it were to be kept within *Cerasus incana* (Pallas) Spach it would have to be given the rank of subspecies.

C. angustifolia, is distinct from *Cerasus incana* (Pallas) Spach, has much smaller, narrower and more southerly range. It falls primarily on the valley of such rivers as the Firat (Euphrat), Çoruh and Araks and on the valleys of their tributaries. It appears that it is more commonly and more abundantly found in the Caucasus, in southern Armeniya, in southwestern Azerbaydzhan SSR, and particularly in Nakhitschevan ASSR. It is less common in Anatolia and very rare in northwestern Iran. It grows on open, insolated and dry places, on rocky and stony slopes, frequently together with *Spiraea hypericifolia* L. On the Caucasus the stands of *C. angustifolia* are distributed between 800 and 1400 m elevation, in Anatolia between 1400 and 1700 m and in Iran between 1100 and 2000 m.

References: 40, 64(4), 103(5), 104(4), 442, 451.

17. *Cerasus brachypetala* Boiss.

Syn.: *Prunus brachypetala* (Boiss.) Walp.

It is a small, prostrate or decumbent, gnarled shrub, usually not taller than 20 cm. It is closely related to *Cerasus prostrata* (Labill.) Ser. and originally it has been considered to be its subspecies or variety. It resembles *Cerasus prostrata* (Labill.) Ser. in growth habit, leaf size and colour of flowers but it differs in having a pubescent ovary either completely or in its upper part.

It is a high elevation species, with a narrow but elongate range, running from southeastern Anatolia, through northeastern Iraq to southwestern Iran. The range is very similar to that of *Rhamnus cornifolius* Boiss. et Hohen. The most northerly stands of *C. brachypetala* occur in the Anatolian province of Muş and the most southerly ones in the Iranian province Fars, near Shiraz. In the southern part of the range, in Iran it is represented by the type variety var. *brachypetala*, while in the north, exclusively in Anatolia by the other var. *bornmuelleri* (C. Schneider) Browicz.

C. brachypetala grows in the mountains, usually above the timber line, where it is prostrate or creeping on rocky usually calcareous slopes, forming in places a continuous mantle. Most commonly it occurs above 2000 m elevation, in Anatolia between 1600 and 2600 m, in Iraq between 1700 and 3200 m, and in Iran between 2300 and 4000 m. The most elevated stands have been noted from the Zagros massif, on Kuh-e-Dinar and Kuh-i-Nur, northwest of Shiraz.

References: 51, 64(4), 228(2), 442.

18. *Cerasus incana* (Pallas) Spach

Syn.: *Prunus incana* (Pallas) Batsch

An erect shrub up to 1.5 - 2 m tall with elliptic to narrowly oblanceolate leaves, 2.5 - 4 times as long as broad.

It is a Caucasian species. It occurs primarily in southern and eastern Caucasus and in adjacent to the

Caucasus regions of northwestern Iran and northeastern Anatolia. Besides isolated stands have been reported from northern and central Anatolia. This xerothermic and light requiring shrub grows singly or in small groups on dry, stony slopes, in open insolated sites. Occasionally, particularly on steep river banks it can form its own, pure lane thickets. It occurs primarily in the lower parts of the mountains, between 600 and 1400 m, however, in Anatolia the stands are scattered between 360 and 2000 m (Agri Dađi) and in Iran between 1000 and 2000 m.

References: 51, 64(4), 103(5), 104(4), 442, 451.

19. *Cerasus microcarpa* (C. Meyer) Boiss.

Syn.: *Prunus microcarpa* C. Meyer

A much ramified, unarmed or only slightly spiny shrub, 1 - 3 m tall, occasionally up to 4 m, sometimes spreading or even prostrate, when old with numerous, cylindrical short-shoots. It is a very variable species in pubescence of leaves and stems, in the shape and dimention of leaves and in the colour of fruits (black, red, yellow). As a result of this, three subspecies are recognized within it, which some taxonomists consider to be independent taxa. The typus subspecies, subsp. *microcarpa*, is characterized by distinctly longer than broader leaves, glabrous on both surfaces and it is distributed throughout the range of the species, however, it is most common in its northern part where the other two subspecies do not occur. The second subspecies, subsp. *tortuosa* (Boiss. et Hausskn.) Browicz (= *Cerasus tortuosa* Boiss. et Hausskn.) occupies the southern part of the range and has more or less pubescent shoots and both leaf surfaces. Finally the third subspecies, subsp. *diffusa* (Boiss. et Hausskn.) Browicz (= *Cerasus diffusa* Boiss. et Hausskn.) has glabrous leaves, roundish, and at most slightly longer than broader. It is much less common than the other two and occurs exclusively in Iran in the southeastern part of the range.

It is an Irano-Turanian species, most frequent and strongest growing of all the small-fruited sour cherries occurring in southwestern Asia. The northern limit of its range passes through eastern Caucasus reaching north to more or less 28° Lat. N and then through southern Turkmeniya (Bol. Balkhan, Kopet Dag Mts.). The most southern limit of *C. microcarpa* reaches Lebanon in the west and the Fars and Kerman provinces of Iran in the east. Much isolated from the relatively continuous range of the species there are outlier stands in Jordan, south of the Dead Sea (Edom, distr. Kerak), in northwestern Afghanistan (Paropamisus Mts.) and recently it had been discovered also in western Anatolia near Elmali (Çiglikara Forest).

Generally speaking *C. microcarpa* occurs in dry regions, in insolated and warm places, however, its site requirements are very diversified. It grows both in lowlands and on mountain slopes, singly or in small groups in degraded and rudimental oak, pistacia or juniper forests, and also it enters the composition of xerothermic thickets with *Paliurus spina-christi* Miller and species from the genus *Rhamnus*, *Lonicera* and *Berberis*.

It appears on sandy, gravelly or stony terrain, in gorges, along streams, on various type of rocks, particularly limestone ones. It is frequently grazed by animals and such deformed, dwarfed specimens can be very spiny.

A similar differentiation can be also found in the vertical distribution of *C. microcarpa* and even though the species is most commonly found on regions above 1000 m, stands of it are known below this elevation. Thus for example in Syria it grows between 400 and 1400 m, in Anatolia between 400 and 2100 m, in Iraq between 460 and 2300 m, in Jordan between 1500 and 1600 m and in Afghanistan at an elevation of 1900 m. The greatest differentiation, however, it is to be observed in Iran, where it occurs between 400 and 3000 m. The most elevated stands are to be found in the central Elburz Mts.

The small, juicy, sour-sweet fruits of this cherry are locally used by people for consumption, however, they are not of any great importance.

References: 51, 64(4), 103(5), 104(4), 163(2), 228(2), 259(2), 417, 451.

20. *Cerasus prostrata* (Labill.) Ser.

Syn.: *Prunus prostrata* Labill.

A low, spreading or procumbent, gnarled shrub, up to 0.5 - 1 m tall, usually, however, much smaller, with branches crawling on the ground or resting on rocks. It is characterized by having numerous rosy-pink flowers, blossoming before leaf flushing.

Within genus *Cerasus*, together with the species described here, *Cerasus angustifolia* (Spach) Browicz, *C. incana* (Pallas) Spach, *C. brachypetala* Boiss. and *C. pseudoprostrata* Pojark., it is included in section *Microcerasus* Spach, subsection *Prostrata* (Pojark.) Browicz. In this subsection there are about 20 closely related species with small leaves and fruits and ranges that do not overlap. They occur from the western Himalayas to the western Mediterranean region. Within the subsection the range of *C. prostrata* is the largest.

It is a Mediterranean, montane species. In the west the range is divided into two distinct parts. The first covers Spain, Corse and Sardegna in Europe and Morocco, Algeria and Tunisia in northwest Africa. The second part starts in western Yugoslavia and Albania covering almost the whole of Greece together with Crete, Euboea, and some other islands located near Anatolia. Then further eastwards *C. prostrata* occurs in western and southern Anatolia, in western Syria and in Lebanon. Its most southern stands, separated from the rest of the range are known from southern Jordan (Edom) – east of Wadi Musa, at 1500 m elevation.

C. prostrata is distributed primarily in the upper parts of the mountains so that its stands are very scattered. It appears on rocky, primarily limestone substrata, in rock fissures, in completely open and sunny places or in shrub communities (especially thorny cushion-like) and even in open cedar forests. In its vertical distribution it is a very differentiated species. As a rule it grows above the tree limit, however, in places when the local conditions permit it can occur quite low down. The lowest locations have been reported from Lesvos Is, at 940 m. In the Balkans the most elevated stands are known from Greece at 2200 - 2400 m, in southwestern Asia in Anatolia at 2750 m (Ala Dağları in province of Niğde), in Lebanon at 2440 and in Syria at 2135 m. In the western part of the range *C. prostrata* occurs at much higher elevations, in Morocco up to 3350 m and in Spain even up to 3415 m.

C. prostrata is a valuable ornamental shrub, useful particularly for rock gardens. It has been introduced into cultivation in early 19th c., however, it is rarely planted.

References: 64(4), 78, 79, 163(2), 425, 442.

21. *Cerasus pseudoprostrata* Pojark.

Syn.: *Prunus pseudoprostrata* (Pojark.) Rech. f.

This is a much ramified, usually spread out shrub 40 - 100 cm tall (sometimes taller) with quite short, thickened and tortuous stems. It is closely related to *Cerasus brachypetala* Boiss.

It is a mountain species restricted in its range to northeastern Iran and southern Turkmeniya (USSR). It has been also found on an isolated stand in Afghanistan. The shrub inhabits open, insolated terrain, stony and gravelly slopes. In places, particularly in higher top parts of mountains it spreads over considerable areas. It grows together with other shrub species primarily from genera *Juniperus*, *Lonicera*, *Cotoneaster*, *Rhmanus* and *Ephedra*. On the most elevated stands its shoots are prostrate on stones not frequently covered with dense cushions of *Gypsophila aretioides* Boiss.

In Turkmeniya it grows primarily in the western and central Kopet Dag Mts. (more rarely in eastern) and in the Bol. Balkhan extending further westwards. On the latter stands *C. pseudoprostrata* in spite of their being the most northerly ones in the whole range, is very abundant, distributed at elevation between 700 and 1650 m. On the other hand, in the Kopet Dag Mts. the shrub usually appears above 1000 m and reaches as high up as 2000 m. The Iranian part of the range covers the central and eastern Elburz Mts. and the mountains of the Khurasan province. Here extremally western stands are to be found in the central part of province Mazandaran (Kandavan pass). *C. pseudoprostrata* grows here usually above 2000 m. The lowest stands

have been observed in Iran at elevations between 1200 and 1300 m and the highest ones between 2800 and 3000 m.

References: 51, 218(2), 442.

Crataegus L.

22. *Crataegus meyeri* Pojark.

A small tree 3-4(5) m tall or a strong shrub. Possibly it is more or less stabilized species of hybrid origin, the parents of which were *Crataegus orientalis* Pallas ex M. Bieb. and *Crataegus aronia* (L.) Bosc ex DC.

It is an Irano-Turanian species, so far insufficiently studied beyond the Caucasus. It occurs also in eastern Anatolia, in northeastern Iraq and on few and far between stands in Iran, on the Elburz and Bakhtiari Mts. It has been reported also from Kuh-e Jebal Barez in the Iranian province of Kerman, which, however, does not appear to be probable.

C. meyeri is a montane xerophyllic species occurring singly or in small groups, on rocky slopes and sloping meadows, in shrub communities or in sparse oakwoods. In Iran it appears between 800 and 1800 m and in Anatolia between 1300 and 2050 m. The most elevated stands have been reported from the Caucasus and from Iran at 2500 m.

References: 51, 64(4), 103(5), 104(4), 218(2), 228(2).

23. *Crataegus microphylla* K. Koch

Syn.: *C. lagenaria* Fischer et *C. Meyer*, *C. orthosepala* (Hauskn. et Bornm.) Bornm.

A shrub 1 - 3(4) m tall with small leaves and characteristically elongated-ellipsoid or pyriform fruits with erect sepals on top.

It is an Euxino-Hyrcanian species with a much elongated range, split into two parts. The first part extends along the coast of the Black Sea in Anatolia to the Caucasus and Crimea, and the latter along the southern shores of the Caspian Sea from the Talish Mts. (USSR) in the west to the Iranian province Khusasan in the east. Not long ago it has been discovered in eastern Bulgaria, in the valley of the river Kamchiya.

C. microphylla is a mesophyllic shrub occurring primarily in broadleaf forests (hornbeam, oak, ash) or on edges of beechwoods and mixed forests. As a rule it grows singly on fertile and moist soils. It appears already from an elevation of 20 - 50 m and extends in the mountains up to 1000 - 1200 m. The most elevated stands have been observed in Crimea at 1250 m, in Anatolia at 1400 m and in Iran at 1600 m.

References: 51, 64(4), 67, 103(5), 104(4), 138, 218(2), 421, 453.

24. *Crataegus orientalis* Pallas ex M. Bieb.

It is a small tree usually 3 - 5 m tall frequently bushy. In extreme cases it attains 7(10) m in height and a stem diameter of 50 cm. It is characterized by considerable variability in the degree of shoots and leaf pubescence, in the depth of sinuses and in the size and colour of fruit which are orange-yellow, though frequently with a larger or smaller red tint. In Anatolia it forms natural hybrids with *Crataegus tanacetifolia* (Lam.) Pers. described as *Crataegus × bornmuelleri* Zabel.

It is a montane species restricted in its range to the Balkan Peninsula and Crimea in Europe and to Anatolia, Caucasus and Talish Mts. in southwestern Asia. It has been erroneously reported from Spain, Sicilia and no-

rthwestern Africa, where a closely related species *Crataegus pubescens* (C. Presl) C. Presl grows. In Anatolia it is undoubtedly the most common species from the genus *Crataegus*, occurring on scattered stands in regions located inside the country – it avoids Mediterranean regions.

On the Balkans it is distributed primarily in Greece and Yugoslavian Macedonia, while it is much less common in Albania and in southern Bulgaria where it is known from only a few stands.

C. orientalis grows primarily in open, strongly thinned and degraded deciduous oak and pine forest, in forest openings, in forest-steppe communities of xerothermic shrubs, on rocky limestone slopes. In Anatolia and on the Caucasus it can be frequently found in hedgerows and among fields and pastures as single individuals where by their presence they testify to the existence of oak forest here before man has destroyed them. Such trees frequently occur together with *Pyrus elaeagnifolia* Pallas and *Pyrus spinosa* Forskal or with *Pyrus syriaca* Boiss. forming the so-called "Wild Orchards", which constitute a very characteristic element of the Anatolian landscape.

In its vertical distribution *C. orientalis* occurs most commonly at elevations between 1000 and 1800 m, rarely getting down to 800 m. The lowest located stands have been reported from Crimea, 200 - 700 m, and the most elevated ones from Nemrut Dağ at 2400 m.

Fleshy and relatively large fruits of *C. orientalis* are consumed by the local population and locally even sold in market places.

References: 64 (4), 67, 79, 103 (5), 104 (4), 138, 426.

Laurocerasus Duhamel

25. *Laurocerasus officinalis* Roemer

Syn.: *Prunus laurocerasus* L.

A strong evergreen shrub with several stems or a small tree up to 6 - 10 m tall, in favourable conditions even taller; stems of such prominent individuals have up to 50 cm diameters. It has large dark green and lustrous leaves with entire margins and white flowers collected in erect, up to 13 cm long, compact racemes. The lower shoots frequently rest on the ground and when covered with decomposing debris of foliage will root giving rise to new individuals. This type of propagation may dominate in some places or be the only mode of propagation as for example on a relict stand in Romania (clonal populations).

It is an Euxino - Hyrcanian species with a range split up into several parts. In Europe it occurs only on the Balkan Peninsula - in the Stara Planina Mts. of central Bulgaria and also along the Black Sea southwestern coast from Bulgaria to European Turkey. Besides completely isolated stands are to be found in Jugoslavia (Serbia), on Mt. Ostrožub, east of Vlasotnice, and in Romania where it has been recently discovered in the Bailuli Mts. (East Carpathians).

The main part of cherry laurel range covers the northern Black Sea part of Anatolia and western Caucasus, though even here complete continuity is lacking since the distinct, though small gap is clearly present in provinces of Sinop, Samsun and Ordu, between Alaçam and Fatsa. Then after a substantial disjunction *L. officinalis* grows again in the Talish Mts. (Azerbaydžhan, USSR) and in the Iranian provinces Gilan and Mazandaran. A small agglomeration of stands is also known from southern Anatolia in the Amanus Mts.

L. officinalis is a mesophyllic and calciphyllic shrub, well tolerating even substantial shading. It grows primarily on fertile, permanently moist soils, primarily in the form of an understory in beech forests (*Fagus orientalis* Lipsky, *F. sylvatica* L.) forming thickets in places compact and difficult to penetrate, pure or together with *Rhododendron ponticum* L., *Ilex colchica* Pojark., *Daphne pontica* L., *Hypericum androsaemum* L., *Vaccinium arctostaphylos* L. and species from the genus *Hedera* and *Ruscus*. Besides it appears also in chestnut and hornbeam forests. On more elevated stands, in the Caucasus and in eastern Anatolia cherry laurel can be found in the brushwood of beech - fir forests or in coniferous forest (*Abies nordmanniana* (Steven) Spach, *Picea orientalis* (L., Link). Here, thanks to the considerable air humidity and high snowfall in the winter it spreads also in open terrain. On the other hand, at lower elevations, along shaded and moist forest gorges it reaches

almost to the sea itself. Thus the vertical distribution of cherry laurel depends in the first place on the soil moisture and air humidity.

In Anatolia the most elevated stands are to be found at 1800 - 2000 m. In the Caucasus *L. officinalis* grows even higher, up to 2200 - 2400 m, and here it is represented by var. *brachystachys* Medw. et Albov, a variety with small dimensions and short inflorescences (ca. 6 cm). In Iran, where it is much less common than in the Euxine Province it occurs primarily between 300 and 1200 m and in the Amanus Mts. between 650 and 1300 m. Also in the European part of the range the vertical span is considerable. In the Bulgarian Strandzha Mts. stands it is located between 160 and 400 m while in Stara Planina more or less between 600 and 1400 m and in Romania between 1080 and 1100 m.

L. officinalis is a very valuable ornamental shrub, very popular in cultivation, particularly in countries with a mild, humid climate. In cultivation it is represented by more than 20 varieties differing from each other in the form of growth and the size and shape of leaves. It is used under canopy of old trees and also formed into hedges.

References: 51, 64 (4), 103 (5), 104 (4), 419, 431, 441, 448,.

Rosa L.

The genus *Rosa* belongs to the group of genera that are particularly complex and difficult taxonomically. The species of roses are very variable and hybridize extremely readily, in many areas, particularly in the eastern zone of the studied region, intensive introgression taking place. As a result opinions about the species concept in relation to this genus are very diversified.

From the region of southwestern Asia more than 100 species are reported. In reality, however, many of these are only taxa of lower rank, hybrids or synonyms. In the present work the species concept expounded in „Flora Iranica” (No. 152, 1982) has been adopted.

26. *Rosa agrestis* Savi

Syn.: *R. chionistrae* Holmboe, *R. arabica* Crépin

An erect, dense shrub with small white flowers and sharply serrate leaflets. This is very variable species particularly in the indumentum of pedicels. Forms with stipitate-glandular pedicels are frequently confused with *Rosa micrantha* Sm. They can be generally distinguished by the small white flowers and more narrow, sharply serrate leaflets.

The range of *R. agrestis* covers the central, western and southern Europe, northwestern Africa, western and northern Anatolia and the Caucasus. The species occurs also on Cyprus (as *Rosa chionistrae* Holmboe) and on the Sinai Peninsula (as *Rosa arabica* Crépin). In southwestern Asia *R. agrestis* is generally a very rare species. It is usually reported from here as *Rosa micrantha* Sm. which does not occur in Asia and the range of which appears to be restricted to Europe and northern Africa.

R. agrestis grows on more or less insolated places, among loose thickets, on forest edges, on pastures, on roadside escarpments, on hedgerows among fields etc. It occurs from the sea level to about 1600 m, generally, however, stands above 1400 m are rare.

References: 16 (Suppl.), 64 (4), 105 (1), 151 (1), 218 (2).

27. *Rosa beggeriana* Schrenk

Syn.: *R. anserinaefolia* Boiss., *R. lacerans* Boiss. et Buhse, *R. silverhjelmi* Schrenk

An erect shrub up to 2 (2.5) m tall, with small white flowers and small fruits having sepals deciduous together with the upper part of the hypanthium.

R. beggeriana is most closely related to *Rosa pisiformis* (Christ) Sosn. from which it differs in having white

rthwestern Africa, where a closely related species *Crataegus pubescens* (C. Presl) C. Presl grows. In Anatolia it is undoubtedly the most common species from the genus *Crataegus*, occurring on scattered stands in regions located inside the country – it avoids Mediterranean regions.

On the Balkans it is distributed primarily in Greece and Yugoslavian Macedonia, while it is much less common in Albania and in southern Bulgaria where it is known from only a few stands.

C. orientalis grows primarily in open, strongly thinned and degraded deciduous oak and pine forest, in forest openings, in forest-steppe communities of xerothermic shrubs, on rocky limestone slopes. In Anatolia and on the Caucasus it can be frequently found in hedgerows and among fields and pastures as single individuals where by their presence they testify to the existence of oak forest here before man has destroyed them. Such trees frequently occur together with *Pyrus elaeagnifolia* Pallas and *Pyrus spinosa* Forsskal or with *Pyrus syriaca* Boiss. forming the so-called "Wild Orchards", which constitute a very characteristic element of the Anatolian landscape.

In its vertical distribution *C. orientalis* occurs most commonly at elevations between 1000 and 1800 m, rarely getting down to 800 m. The lowest located stands have been reported from Crimea, 200 - 700 m, and the most elevated ones from Nemrut Dağ at 2400 m.

Fleshy and relatively large fruits of *C. orientalis* are consumed by the local population and locally even sold in market places.

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***Laurocerasus* Duhamel**

25. *Laurocerasus officinalis* Roemer

Syn.: *Prunus laurocerasus* L.

A strong evergreen shrub with several stems or a small tree up to 6 - 10 m tall, in favourable conditions even taller; stems of such prominent individuals have up to 50 cm diameters. It has large dark green and lustrous leaves with entire margins and white flowers collected in erect, up to 13 cm long, compact racemes. The lower shoots frequently rest on the ground and when covered with decomposing debris of foliage will root giving rise to new individuals. This type of propagation may dominate in some places or be the only mode of propagation as for example on a relict stand in Romania (clonal populations).

It is an Euxino - Hyrcanian species with a range split up into several parts. In Europe it occurs only on the Balkan Peninsula - in the Stara Planina Mts. of central Bulgaria and also along the Black Sea southwestern coast from Bulgaria to European Turkey. Besides completely isolated stands are to be found in Jugoslavia (Serbia), on Mt. Ostrozub, east of Vlasotnice, and in Romania where it has been recently discovered in the Bailuli Mts. (East Carpathians).

The main part of cherry laurel range covers the northern Black Sea part of Anatolia and western Caucasus, though even here complete continuity is lacking since the distinct, though small gap is clearly present in provinces of Sinop, Samsun and Ordu, between Alaçam and Fatsa. Then after a substantial disjunction *L. officinalis* grows again in the Talish Mts. (Azerbaijan, USSR) and in the Iranian provinces Gilan and Mazandaran. A small agglomeration of stands is also known from southern Anatolia in the Amanus Mts.

L. officinalis is a mesophyllic and calciphyllic shrub, well tolerating even substantial shading. It grows primarily on fertile, permanently moist soils, primarily in the form of an understorey in beech forests (*Fagus orientalis* Lipsky, *F. sylvatica* L.) forming thickets in places compact and difficult to penetrate, pure or together with *Rhododendron ponticum* L., *Ilex colchica* Pojark., *Daphne pontica* L., *Hypericum androsaemum* L., *Vaccinium arctostaphylos* L. and species from the genus *Hedera* and *Ruscus*. Besides it appears also in chestnut and hornbeam forests. On more elevated stands, in the Caucasus and in eastern Anatolia cherry laurel can be found in the brushwood of beech - fir forests or in coniferous forest (*Abies nordmanniana* (Steven) Spach, *Picea orientalis* (L., Link). Here, thanks to the considerable air humidity and high snowfall in the winter it spreads also in open terrain. On the other hand, at lower elevations, along shaded and moist forest gorges it reaches

alm ost to the sea itself. Thus the vertical distribution of cherry laurel depends in the first place on the soil moisture and air humidity.

In Anatolia the most elevated stands are to be found at 1800 - 2000 m. In the Caucasus *L. officinalis* grows even higher, up to 2200 - 2400 m, and here it is represented by var. *brachystachys* Medw. et Albov, a variety with small dimensions and short inflorescences (ca. 6 cm). In Iran, where it is much less common than in the Euxine Province it occurs primarily between 300 and 1200 m and in the Amanus Mts. between 650 and 1300 m. Also in the European part of the range the vertical span is considerable. In the Bulgarian Strandsha Mts. stands it is located between 160 and 400 m while in Stara Planina more or less between 600 and 1400 m and in Romania between 1080 and 1100 m.

L. officinalis is a very valuable ornamental shrub, very popular in cultivation, particularly in countries with a mild, humid climate. In cultivation it is represented by more than 20 varieties differing from each other in the form of growth and the size and shape of leaves. It is used under canopy of old trees and also formed into hedges.

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Rosa L.

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The range of *R. agrestis* covers the central, western and southern Europe, northwestern Africa, western and northern Anatolia and the Caucasus. The species occurs also on Cyprus (as *Rosa chionistrae* Holmboe) and on the Sinai Peninsula (as *Rosa arabica* Crépin). In southwestern Asia *R. agrestis* is generally a very rare species. It is usually reported from here as *Rosa micrantha* Sm. which does not occur in Asia and the range of which appears to be restricted to Europe and northern Africa.

R. agrestis grows on more or less insolated places, among loose thickets, on forest edges, on pastures, on roadside escarpments, on hedgerows among fields etc. It occurs from the sea level to about 1600 m, generally, however, stands above 1400 m are rare.

References: 16 (Suppl.), 64 (4), 105 (1), 151 (1), 218 (2).

27. *Rosa beggeriana* Schrenk

Syn.: *R. anserinaefolia* Boiss., *R. lacerans* Boiss. et Buhse, *R. silberhjelmii* Schrenk

An erect shrub up to 2 (2.5) m tall, with small white flowers and small fruits having sepals deciduous together with the upper part of the hypanthium.

R. beggeriana is most closely related to *Rosa pisiformis* (Christ) Sosn. from which it differs in having white

flowers, strongly hooked prickles, in colour of stems and in the range of distribution. Many hybrids between this species and *Rosa webbiana* Wall. ex Royle are known.

The disjunctive range of *R. beggeriana* covers Iran (except for its western part), the mountains of Kopet Dag on the border between Iran and Turkmeniya, Afghanistan (except for the south), Pakistan (Chitral, Quetta, Baluchistan), Middle Asiatic republics of the USSR and western China (Dzhungaria, Kashgaria). It is known also from several stands in western Anatolia, however, these stands are of antropogenic nature.

R. beggeriana grows usually singly or in small groups, on slopes of mountains, in valleys of rivers, in open places or more frequently among thickets, on edges or inside sparse deciduous forests etc. It is accompanied by various species of hawthorns, roses, *Elaeagnus orientalis* L., *Hippophaë rhamnoides* L., *Prunus divaricata* Ledeb., *Acer turkestanicum* Pax etc.

In Iran it grows between 1400 and 3300 m, in Afghanistan from 1500 to 3000 m, in Pakistan between 1700 and 3000 m and in Middle Asia from 400 to 3000 m.

References: 16 (Suppl.), 218 (2), 427, 455.

28. *Rosa boissieri* Crépin

Syn.: *R. woronowii* Lonacz., *R. dumalis* Bechst. subsp. *boissieri* (Crépin) Ö. Nilsson

An erect shrub, up to 3(4) m tall with large, usually bristly fruits. This taxon is related most to the European species *Rosa montana* Chaix and *Rosa dumalis* Bechst.

The continuous range of *R. boissieri* covers almost the whole Caucasus, northeastern Anatolia, northern Iraq and northwestern Iran. Besides, on isolated stands this rose can be found in central and southern Anatolia, in northern Iran and in Lebanon.

R. boissieri grows on rocky slopes, on stony meadows, on roadside escarpments, inside open forests, both deciduous and coniferous, on their edges, etc.

On the Caucasus it reaches as far up as 2700 m elevation, in Anatolia it grows between 1000 and 2750 m and in Iran between 1800 and 2600 m. On one stand in Lebanon it has been collected from the top of Jebel Sannin at 2600 m.

References: 64(4), 103(5), 104(4), 218(2), 436, 455.

29. *Rosa brunonii* Lindley

A climbing, semievergreen shrub with branches reaching up to 10 - 15 m and with numerous white flowers forming panicles. It is a species from section *Synstylae* DC., most closely related to *Rosa moschata* Herrm. with which it is frequently identified. It differs from the latter in having more abundant inflorescences, narrower leaflets and frequently pubescent and glandular twigs.

R. brunonii occurs in a narrow belt along the feet of the Hindukush and the Himalayas, starting from Afghanistan (Nuristan) through Pakistan (Chitral, Swat, Gilgit), Kashmir, Nepal to Szechwan in southwestern China. It grows on more or less moist places, in shady valleys, on bank of rivers and streams, on edges or inside sparse oakwoods (*Quercus baloot* Griffith), inside mixed forests of *Cedrus deodara* (D. Don.) G. Don, *Pinus griffithii* McClelland, *Ulmus wallichiana* Planchon, *Aesculus indica* (Wall. ex Cambess.) Hook f. and al. and more rarely among thickets in fields, near roadsides etc. It occurs between 900 and 2200 m elevation.

References: 443, 455.

30. *Rosa canina* L.

Syn.: *R. corymbifera* Borkh., *R. dumetorum* Thuill.

A shrub 1 - 4(5) m tall with straight or arched shoots. This species is extremely variable particularly in the indumentum of leaves, pedicels and fruits and as a result it is frequently treated as a collective species. One of the most commonly recognized taxons out of *R. canina* is *R. corymbifera* Borkh. which group forms having more or less pubescent leaves. This view, however, is not fully justified.

R. canina is characterized by the most extensive range from among all species included in section *Caninae* DC. In Europe this rose is absent from the far north and from the most easterly regions. Outside Europe it grows in northwestern Africa and in southwestern and Middle Asia. In the Asiatic part of the range of *R. canina* it occurs in Anatolia, in Lebanon in northeastern Iraq, on the Caucasus, in northern and western Iran, in northern Afghanistan, in northern Pakistan, in Kashmir and in the Middle Asiatic republics of USSR.

This species is characterized by an exceptionally wide ecological range. It occurs both on open, sunny places and under considerable shade, on dry soils and in clearly moist places. It grows singly or in small groups, usually in thickets, on forest edges, on hedgerows, on roadside escarpments, on river banks, along streams etc.

R. canina is quite common in the lowlands and in the mountains. In Middle Asia it occurs up to 2200 m elevation. In Anatolia, Iran, Afghanistan and Pakistan it reaches up to 2500 m and in Iraq even up to 2900 m.

References: 64(4), 103(5), 138, 151(1), 163(2), 218(2), 259(2), 455.

31. *Rosa ecae* Aitch.

A compact, strongly prickly shrub 1 (1.5) m tall with small leaflets and small bright yellow flowers. *R. ecae* is closely related to *Rosa platyacantha* Schrenk described from Dzhungaria, western China. It is not impossible that both these species represent one and the same polymorphic taxon.

R. ecae has a disjunctive range composed of two parts separated by a distance of about 3000 km. The larger one is in southwestern and Middle Asia (Afghanistan, Pakistan, Tadzhikistan, southeastern Kazakhstan, Kirgiziya). The smaller part covers a relatively restricted area in eastern China (Szechwan).

It grows on dry slopes, among rock rubble, on mobile slopes, in dry gorges, among steppe vegetation and in xerothermic thickets where it is frequently the dominant species. It is frequently accompanied by *Rosa kokanica* (Regel) Juz., *Lonicera microphylla* Willd., *Berberis oblonga* (Regel) C. Schneider, *Caragana alalaia* Pojark., *Spiraea hypericifolia* L., *Ephedra equisetina* Bunge and others.

In Middle Asia *R. ecae* attains an elevation of 3000 m. In northeastern Afghanistan (Nuristan) it occurs between 1500 and 3400 m and in Pakistan, from where it has been reported primarily from Chitral province, between 1500 and 3500 m. It attains its elevational maximum on Tirich Mir.

References: 177(4), 218(2), 417, 434, 444, 455.

32. *Rosa elymaitica* Boiss. et Hausskn.

A slender, spreading shrub, up to 1 m tall, with small, roundish leaflets and small, globose fruits 10 - 12 mm in diameter.

The small range of distribution is restricted to southwestern Asia and is composed of two parts separated by a distance of 700 km. The larger part is in eastern Iraq and northwestern Iran and the smaller in northeastern Anatolia. Besides it has been erroneously reported from the Caucasus. In Iraq *R. elymaitica* occurs exclusively in montane, forested regions of province of Sulaymaniyah, particularly along the border with Iran. In Iran it grows in most of the Zagros Mts. and in the western parts of the Elburz Mts.

The eastern limit of the range is approximately marked by Tehran, Qom, Esfahan and Shiraz. In Anatolia *R. elymaitica* occurs only in the vicinity of Artvin and Erzurum.

R. elymaitica grows on dry, stony mountain slopes, among thorny thickets, in open oakwoods, along the banks of streams, in fields, on edges of pastures etc., most commonly on limestone substratum. In Anatolia it occurs between 800 and 2000 m elevation, in Iraq between 1500 and 2000 m and in Iran between 1100 and 3300 m. The most elevated stands are near Hamadan.

References: 16 (Suppl.) 64(4), 228(2), 427, 455.

33. *Rosa foetida* Herrm.

Syn.: *R. lutea* Miller

An erect shrub up to 3 (4) m tall with bright yellow petals, sometimes suffused with red and with chestnut, brown, lustrous stems.

This species is closely related to and frequently not distinguished from *Rosa kokanica* (Regel) Juz. and *R. hemisphaerica* Herrm. From the former it differs primarily in having dilated apically sepals and lustrous twigs, and from the latter in green (not glaucous) leaflets below and subulate prickles. According to some authors *R. foetida* is an old hybrid cultivated already in antiquity, presently only gone wild from cultivation.

R. foetida occurs on very scattered stands starting from the western shores of Anatolia through southern region of the Caucasus, northeastern Iraq to northwestern Iran. After a considerable disjunction it reappears again in Afghanistan, in Pakistan and in Middle Asiatic republics of the USSR. It usually grows on slopes, on roadside escarpments, in fields, not infrequently near buildings.

In Anatolia *R. foetida* occurs between 600 and 1900 m elevation, in Iraq from 850 to 1500 m, in Iran between 1200 and 2200 m, in Afghanistan from 1700 to 2200 m and in Pakistan between 1700 and 2850 m.

This rose is frequently cultivated as an ornamental plant and it is one of the forms that gave origin to the yellow flowered varieties of garden roses.

References: 64(4), 103(4), 228(2), 434, 437, 444, 455.

34. *Rosa freitagii* Ziel.

A climber up to 3 - 4 m tall, with very characteristic leaves composed of 3 roundish, shiny leaflets. It is most closely related to *Rosa moschata* Herrm., a species presently known only from cultivation.

A species endemic to Afghanistan. So far it is known from only few stands in central and southeastern part of the country in provinces of Ghorat, Farah and Kandahar. Most commonly it grows in thickets on banks of streams, in gorges, on mountain slopes, etc., between 1400 and 2600 m elevation.

References: 455.

35. *Rosa gallica* L.

An erect shrub with rhizomes, up to 0.5 - 1 m tall, with relatively large flowers and delicate shoots covered with needle-like bristly prickles.

The range of *R. gallica* covers primarily the central and southeastern Europe. In southwestern Asia this species occurs only on infrequent strongly scattered stands in western regions of the Caucasus and in northern Anatolia. It grows in places on more or less insolated sites, on edges of sparse oakwoods, in sparse thickets, on edges of fields, on hedgerows, on roadside escarpments, etc. It is a lowland species, usually not growing higher than 500 - 600 m elevation.

R. gallica is one of the parental forms for the roses *Rosa* × *damascena* Miller and *Rosa* × *rentifolia* L. cultivated since antiquity.

References: 16 (Suppl.) 64(4), 103(5), 138, 156, 218(2), 455.

36. *Rosa hemisphaerica* Herrm.

Syn.: *R. sulphurea* Aiton., *R. rapinii* Boiss. et Bal., *R. bungeana* Boiss. et Buhse

A compact, strongly prickly shrub up to 1 (1.5) m tall with bluish small leaflets and bright yellow flowers. It is endemic for southwestern Asia. It occurs primarily in central and eastern Anatolia and in Transcaucasus (Armeniya, Nakhichevan, Azerbaydzhan). After a disjunction of about 700 km it appears again on infrequent stands in northern Iran in Semnan region and in the southwestern regions of USSR Turkmeniya (Kopet Dag).

It grows most commonly on limestone, on dry, stony, frequently intensively grazed slopes, in dry gorges, among thorny thickets and on edges of open oakwoods. It occurs between 600 and 1800 m elevation.

This species is sometimes cultivated and goes wild. In cultivation primarily its double-flowered forms are used as the basic material for breeding of garden, yellow roses.

References: 64(4), 103(5), 104(4), 218(2), 437, 444, 454, 455.

37. *R. horrida* Fischer

Syn.: *Rosa turcica* Rouy, *R. ferox* M. Bieb.

A compact, strongly prickly shrub, usually no more than 1.5 m tall with white, small flowers and small, roundish, strongly glandular leaflets.

This species is very characteristic though relatively variable, particularly in the armature of shoots. Forms with shoots devoid of acicles are frequently confused with *Rosa micrantha* Borrer, from which they can be distinguished by the purely white flowers, usually smooth and very short pedicels and more strongly lobed sepals. In the vegetative conditions it can be mistaken with the small-leaved forms of *Rosa pulverulenta* M. Bieb., it differs, however, in having glabrous style and deflexed and early deciduous sepals.

The small range of *R. horrida* covers southern Balkans (southeastern Romania, Bulgaria, eastern Greece, European Turkey), Crimea, northwestern Anatolia and western Caucasus (Abkhazskaya ASSR).

It grows most commonly on limestone, on open, sunny places, on stony slopes, among loose thickets, in open, sparse forests. Having numerous hooked prickles it survives even on intensively grazed regions, on pastures, along road, etc.

In its vertical distribution it covers regions usually located between 200 and 1200 m. The most elevated stand has been found in northern Anatolia, near Bolu at 1700 m.

References: 64(4), 103(5).

38. *Rosa iberica* Steven

A compact shrub up to 2 m tall with glandular, deliciously scented leaves.

This is an endemic species for southwestern Asia. Its range covers almost the whole Caucasus, north-eastern Anatolia, northern Iraq, northern Iran and the Kopet Dag Mts. on the border between Iran and Soviet Turkmeniya. On isolated stands *R. iberica* can be found in northern Anatolia in the regions of Bolu and Amasya. It grows on stony slopes, in dry gorges, on edges of sparse oakwoods, among thickets, on edges of fields, on roadside escarpments, etc.

On the Caucasus it attains 2400 m elevation, in Anatolia it grows between 900 and 2400 m, in Iraq between 1000 and 1480 m and in Iran between 850 and 2660 m.

References: 64(4), 103(5), 218(2), 228(2), 455.

39. *Rosa jundzillii* Besser

An erect shrub up to 1 (2) m tall with relatively large coriaceous leaves.

This species occurs primarily in the central regions of western, central and eastern Europe. The most westerly stands are in central and southern France and in northern Italy, and the most easterly reach the river Don. This species is completely absent in northern Europe, however, in the south it occurs only in eastern regions, on strongly dispersed stands. Similarly infrequent are stands of *R. jundzillii* in southwestern Asia, where it is known only from western regions of the Caucasus and from northern Anatolia.

It grows on more or less insolated locations, on slopes, on field edges, in thickets, more rarely inside open and sparse forests, both deciduous and coniferous.

It is a lowland species, rarely growing above 1000 m elevation. The stands in Anatolia at 1250 m are among the most elevated ones.

References: 64(4), 103(5), 138, 156, 218(2), 437.

40. *Rosa kokanica* (Regel) Juz.

Syn.: *R. divina* Sumn., *R. ovczinnikovii* Koczk.

An erect shrub up to 1 (1.5) m tall with bright yellow flowers and brownish-red fruits. This species is most closely related to *Rosa ecae* Aitch. and *Rosa foetida* Herrm. with which it is very frequently confused. From the former it differs in having pubescent style and greater dimensions of various organs and from the latter in having sepals gradually narrowing to the apex and also in the shape of leaflets.

The compact range of *R. kokanica* covers the Middle Asiatic republics of the USSR (Tadzhikistan, Kirgiziya, southeastern Kazakhstan) western regions of Kashgaria and Dzhungaria (China) and northeastern Afghanistan. There is also an isolated stand of *R. kokanica* in northern Pakistan (Gilgit), however, it is possible that it went wild there from cultivation.

It usually grows on dry stony slopes, in dry gorges, on roadside escarpments, on spree, in open places or in open sparse forests of *Juglans regia* L. and *Acer turkestanicum* Pax. It occurs singly or forms thickets where it is accompanied by *Rosa ecae* Aitch., *Cerasus mahaleb* (L.) Miller, *Cerasus tianschanica* Pojark., *Spiraea hypericifolia* L., *Cotoneaster multiflorus* Bunge, numerous species of *Crataegus* etc. In the Soviet part of the range it occurs from 900 to 3000 m elevation. In Afghanistan it has been collected between 1400 and 3000 m.

In cultivation and also in the wild state it is possible to find double-flowered forms of *R. kokanica*.

References: 177(4), 218(2), 417, 434, 455.

41. *Rosa macrophylla* Lindley

An erect shrub up to 3 (4) m tall with dark red flowers and elongated, bottle-shaped fruits. This species is closely related to the European *Rosa pendulina* L., within which it is sometimes discussed jointly as its variety. It is frequently confused with the large leaved forms of *Rosa webbiana* Wall. ex Royle from which it can be distinguished by the delicately serrulate leaflets, more numerous veins and more delicate floral peduncles.

The range of *R. macrophylla* covers almost exclusively the Hindukush and the Himalayas. It extends as a narrow belt from northeastern Afghanistan (Nuristan) through northern Pakistan, Kashmir, Nepal to southwest China. In the western regions of the range *R. macrophylla* it is a relatively rare species. Reports about its abundant occurrence in the region are not confirmed by herbarium collections. It is not unlikely that at least some of the literature reports concern the above mentioned large leaved forms of *Rosa webbiana* Wall. ex Royle.

R. macrophylla grows on more or less moist places, on banks of rivers and streams, at bottoms of moist valleys, among thickets, on edges or inside open, sparse forests or in forest openings, along forest roads etc. It occurs from 2000 to 3400 (3600) m elevation.

References: 225, 427, 455.

42. *Rosa orientalis* Dup. ex Sér.

Syn.: *R. vanheurckiana* Crépín, *R. atropatana* Sosn.

A shrub up to 1 (1.5) m tall with velutinous young shoots and leaves.

The species is closely related to the European *R. heckeliana* Tratt. with which it is frequently treated jointly as its subspecies. Differences between *R. orientalis* and *R. heckeliana* Tratt. are subtle, however, the two taxa are fully separated geographically.

R. orientalis is an endemite of southwest Asia. Its range covers central and southeastern Anatolia, northern Iraq, the Transcaucasus (Armeniya, Azerbaydzhan) and northwestern Iran. Single isolated stands of this rose are also known from Lebanon and southwestern Syria (Anti-Lebanon Mts.).

R. orientalis usually grows on a limestone substratum in sunny places, on stony slopes, in ravines, on banks of streams, on edges of pastures, among thorny thickets, in open oakwoods and on their edges. In Anatolia it occurs between 1200 and 2900 m, in Iraq from 1500 to 3300 m and in Iran between 1700 and 3300 m.

References: 64(4), 103(5), 163(2), 437, 455.

43. *Rosa persica* Michaux ex Juss.

Syn.: *R. berberifolia* Pallas, *Hulthemia persica* (Michaux ex Juss.) Bornm.

A shrub up to 30 (60) cm tall with single leaves devoid of stipules and with yellow flowers and a brown-red spot at the base of petals.

This species is sometimes discussed under the name *Hulthemia persica* (Michaux ex Juss.) Bornm. It is very variable in the size of various organs and in the degree of pubescence. Forms with pubescent shoots and leaves predominating in the northern regions of the species range are frequently recognized as a separate species, *Rosa berberifolia* Pallas. Two spontaneous hybrids of *R. persica* are known: *R. × kopetdaghensis* Meff., and *R. × guzarica* Juz.

R. persica is a classical representative of the Irano-Turanian floristic element. Its range is restricted almost exclusively to southwestern and Middle Asia and is composed of two basic parts. The smaller part covers western and northern Iran, southwestern region of Soviet Turkmeniya (Kopet Dag) and northwestern Afghanistan. The second, much larger part, covers almost all the Middle Asiatic republics of the USSR and southern regions of western Siberia.

Temperature and light are the factor decisive for the occurrence of *R. persica*. This species grows exclusively on open sunny places, on stony, frequently salty soils, on waste land, on abandoned fields, on roadside escarpments, on not very steep slopes etc. It enters also less intensively cultivated fields where thanks to its long and numerous sprouts it can be one of the most persistent and difficult to eradicate weeds.

In vertical distribution *R. persica* covers regions from the sea level, as on Aral Sea, to 2400 m in the Iranian part of the range (Hamadan).

References: 177(4), 218(2), 434, 454, 455.

44. *Rosa phoenicia* Boiss.

A climber attaining up to 3 - 5 m in height with white, small flowers forming panicles.

The disjunctive range of *R. phoenicia* is almost exclusively on regions located along the eastern shores of the Mediterranean and Aegean Seas. It covers northern Israel, Lebanon, southwestern regions of Syria and western shores of Anatolia. Inside the continent *R. phoenicia* grows only in southeastern Turkey in the region of Siirt and in northeastern Iraq. From Europe it has been reported from Greece, from the vicinity of Xanthi, however, this information requires checking.

R. phoenicia is a relatively rare species. As a rule it grows scattered, on more or less moist places, at the bottom of shady valleys, along streams and rivers, in thickets, more rarely inside sparse oakwoods. It is associated primarily with the lower elevations and rarely exceeds 1000 m elevation. The highest located stands at 1300 - 1500 m are known from the Mt. Cassius on Turkish-Syrian border.

R. phoenicia is probably besides *R. gallica* L. one of the parental forms for *Rosa* × *damascena* Miller that has been under cultivation already since antiquity.

References: 64(4), 163(2), 228(2), 259(2), 455.

45. *Rosa pimpinellifolia* L.

Syn.: *R. spinosissima* L.

A low, erect, suckering shrub, as a rule not taller than 1 m, with numerous bristly prickles and black, hard fruits.

R. pimpinellifolia occupies two main disjunct areas. The first is in western and southern Europe and in southwestern Asia. The second comprises eastern Kazakhstan, western China, northwestern Mongolia and southwestern Siberia (Altay). This species has been also recorded from eastern Asia (Korea, China) but these information require checking.

In southwestern Asia *R. pimpinellifolia* grows exclusively on Caucasus and in adjacent regions of Anatolia and Iran. It occurs in sunny places, on dry slopes, on rock faces, in dry valleys, on roadside escarpments, among thickets, inside open forests and sometimes in abandoned orchards, etc.

On the Caucasus *R. pimpinellifolia* grows as high up as 3000 m, in Anatolia between 1900 and 2750 m and in Iran it is known from two stands at 1800 - 2000 m elevation.

References: 64(4), 103(5), 104(4), 138, 156, 218(2), 437, 444, 455.

46. *Rosa pisiformis* (Christ.) Sosn.

An erect shrub up to 2 m tall, with a brownish, lustrous stems and small fruits from 8 to 10 mm in diameter and with the sepals deciduous together with the upper part of the hypanthium. This species is most closely related to *Rosa beggeriana* Schrenk, from which it differs in having dark-red flowers and delicate, straight prickles.

R. pisiformis is a Turkish endemite. It grows only on infrequent stands in northeastern and eastern Anatolia. It is one of a few roses occurring almost exclusively on moist even boggy places. It has usually been found in thickets directly along rivers and streams, together with other mesophyllic plants, particularly species from the genus *Salix*. It is known from elevations between 1600 and 2000 m.

References: 64(4), 104(4), 437.

47. *Rosa pulverulenta* M. Bieb.

Syn.: *R. glutinosa* Sibth. et Smith, *R. sicula* Tratt.

A low, strongly prickly shrub 0.1 - 0.5 (1) m tall, usually with subterranean rhizoms, with leaves abundantly glandular.

This species is exceptionally variable in armature of shoots, shape and size of leaves and indumentum. Within the species so far many taxa have been described, a few even in the rank of species e.g. *Rosa sicula* Tratt. and *Rosa glutinosa* Sibth. et Smith. Characters by which these species are distinguished from *R. pulverulenta* s. str. are, however, not correlated with each other.

The extensive range of *R. pulverulenta* is a narrow belt extending from northwestern Africa through the northern Mediterranean, Anatolia, Caucasus, northwestern and northern Iran and southwestern regions of USSR, Turkmeniya (Kopet Dag).

R. pulverulenta usually grows on limestone or on rocks of vulcanic origin, on dry slopes, on stony, dry gorges, on edges of pastures, in thickets, in open, sparse coniferous forests, on subalpine meadows, etc.

In Turkey this species usually occurs at elevation between 1000 and 2500 m, locally coming down to 500 - 700 m. On the Caucasus it appears at similar elevations, however, in Iran from 1500 to 3000 m with the most elevated stand in the northwest of the country near Qazvin.

References: 64(4), 103(5), 105(1), 218(2), 437, 455.

48. *Rosa sempervirens* L.

An evergreen climber with shoots climbing up to 8 (10) m, with white flowers forming panicles or corymbs.

The range of *R. sempervirens* is associated with the Mediterranean region. It extends as a narrow belt from western France and Morocco in the west to the western shores of Anatolia, in the east.

This species is associated almost exclusively with maquis. It occurs usually as single specimens or in small groups near *Erica arborea* L., *Arbutus unedo* L., *Arbutus andrachne* L., *Phillyrea latifolia* L., *Quercus coccifera* L., *Pistacia lentiscus* L., *Rhamnus alaternus* L., etc. It is frequently accompanied by such climbers as *Clematis cirrhosa* L., *Ephedra fragilis* Desf. subsp. *campylopoda* (C. Meyer) Asch. et Greabner and *Smilax aspera* L. In contrast to the majority of species forming the maquis *R. sempervirens* grows as a rule in places where at least during the rainy season it has abundant moisture in the soil, that is in various depressions in the terrain, in valleys of streams drying up for the summer, along streams and rivulets, etc. Much less commonly it occurs in roadside ditches, on edges of fields, on loose thickets representing remnants of a maquis, in blackberry thickets, etc. In these places, however, it is much less vigorous.

In vertical distribution *R. sempervirens* occurs from the sea level to about 1300 m; in the eastern regions of the range it does not exceed 600 - 800 m elevation.

References: 64(4), 105 (1; Suppl. 2), 456.

49. *Rosa villosa* L.

Syn.: *R. mollis* Smith

An erect shrub, as a rule not taller than 1.5 m, with glaucous, pubescent leaflets and straight, bristly prickles. It is a fairly variable species. Forms with smaller fruits and rounded leaflets are frequently recognized as a separate species *Rosa mollis* Smith, however, so far sufficient basis for support of these opinion is absent.

The extensive range of *R. villosa* covers northwestern and central Europe, the Caucasus and northern regions of Asia Minor. In southeastern Europe *R. villosa* is very scattered thus the European part of the range is practically isolated from the Asiatic part.

As a rule it grows on stony slopes, on edges of pastures, inside open, sparse oakwoods, on subalpine meadows, not infrequently along roads, in fields and near houses.

In southwestern Asia *R. villosa* is relatively frequently the only one growing in the Caucasus, where most probably it does not exceed 2300 m elevation. Beyond the Caucasus it grows only in northern Anatolia, on infrequently scattered stands. Here it has been reported from elevation between 1300 and 2500 m.

In the past it used to be cultivated for its large, tasty fruits, from which compotes and jams were made. In many places it is probably only an escape from cultivation thus the exact delimitation of its natural range is practically impossible.

References: 64(4), 103(5), 138, 218(2), 437.

50. *Rosa webbiana* Wall. ex Royle s.l.

Syn.: *R. maracandica* Bunge, *R. fedtschenkoana* Regel

An erect shrub up to 2 (3) m tall. It is one of the most difficult and least understood species within the genus. It represents a mosaic of biotypes sometimes differing significantly in morphology. These biotypes on the basis of which many species have been described differ exclusively in quantitative characters and are linked by numerous intermediate forms. The situation is further complicated by the presence of numerous hybrids which this species forms with *Rosa beggeriana* Schrenk.

The range of *R. webbiana* covers the Middle Asiatic republic of the USSR, western China (Kashgaria, Dzhungaria), northeastern Afghanistan, northern Pakistan, Kashmir, the Himalayas and southwestern China.

R. webbiana usually grows singly or in small groups, on stony mountain slopes, in gorges, in valleys of rivers, on open places or in thickets, not infrequently in sparse forests of juniper (*Juniperus turkestanica* Komarov and *Juniperus semiglobosa* Regel), in open forests of *Acer turkestanicum* Pax etc. In Middle Asia it occurs between 1500 and 3900 m, in Afghanistan from 1400 to 4000 m and in Pakistan from 1900 to 3600 m.

References: 174(4), 218(2), 427, 434, 455.