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## Geographic distribution of some shrubs from the family *Leguminosae* in southwestern Asia

In recent years thanks to the intensive floristic studies being conducted in southwestern Asia our information (herbarium specimens, publications) about the occurrence of plants in the region has increased so much that in many instances it became possible to present their ranges of distribution not only in the form of line maps but also as point maps. This concerns both the common species and the rare ones about which until recently our information was rather scanty, and vague.

Below the ranges of 5 species of shrubs from the family *Leguminosae*, subfamily *Papilionoideae* are given, all of which are considered as belonging to the Mediterranean floristic element. Two of these *Anagyris foetida* and *Calycotome villosa* have to be considered as omni-Mediterranean since they occur in southern Europe, North Africa and in the western part of southwestern Asia. Their ranges of distribution are very similar, the major difference being that *Anagyris foetida* occurs much further to the east reaching even western Iran. The remaining three species: *Anthyllis hermanniae*, *Cytisopsis pseudocytisus* and *Padocytisus caramanicus* are east-Mediterranean species, unknown both in North Africa and in southwestern Europe. They are characterized by an interesting distribution, and their ranges do not overlap with each other or do so to a very limited extent.

Four of the studied species (except *Cytisopsis pseudocytisus*) have ranges extending substantially in the westerly direction, beyond the region of southwestern Asia. In order to better understand their European geographic relations, the range maps have been prepared also for the Aegean Islands, the Balkan Peninsula and northeastern Africa. These are not critical species so that in the preparation of point maps it was possible to use not only the herbarium sheets but also data gathered from various publications.

In the case of the Balkan Peninsula and particularly in Greece, the Islands of the Aegean and Crete I have used primarily the lists of stands published by Reching er (1943a, 1943b, 1961), Halácsy (1901, 1908,

1912) and Zaffran (1976), and also herbarium collections in the Naturhistorisches Museum Herbarium in Vienna. List of stands I have prepared only for the countries of southwestern Asia, except for *Podocytisus carmanicus* a species characterized by a very interesting disjointed range restricted only to the Balkan Peninsula and Anatolia. Against stands that have been quoted from literature I always refer to the appropriate bibliography and in the case of information from herbarium sheets the appropriate abbreviation of the Herbarium in which the sheets are located.

#### 1. ANAGYRIS FOETIDA L.

The genus *Anagyris* is represented by two species. One of these *A. latifolia* Brouss occurs only on the Canary Islands, where it is known only from Tenerife at 200 - 500 m elevation and from one stand on the island Gran Canaria (Bramwell, Bramwell, 1974). On the other hand the range of the other species, *A. foetida* is very extensive covering parts of three continents, Africa, Asia and Europe. In Europe *A. foetida* is a characteristic component of the Mediterranean macchia and is distributed from southern Portugal in the west to European Turkey in the east, through Spain, France, Italy, Jugoslavia, Albania and Greece. It grows also on the islands of the Mediterranean — the Balearic Is., Corsica, Sardinia, Sicily, Malta, Crete and the Aegean Is. In North Africa it is known from Morocco, Algeria and Libya.

In southwestern Asia the range of this species covers Turkey, Cyprus, Syria, Lebanon, Israel, Jordan, Egypt, Iraq and Iran. Only in the latter two countries and in southeastern Anatolia *A. foetida* grows to any extent inland — in the other parts of the range it occurs primarily in regions not very far removed from the sea coast (Fig. 1).

In Iran, where *A. foetida* attains the southeastern limit of its range more or less at 34° latitude N and 46°20' longitude E, the shrub is known, at least so far only from the Kermanshah province in the northern parts of the Zagros mountain range at an elevation of 1000 - 1800 m. It is more common, however, in the neighbouring Iraq, in the mountains of southern Kurdistan. It grows there between 500 and 1100 m elevation and only exceptionally attains 1200. According to Handel-Mazzetti (*in sched.*) in isolated mountains of Kurdistan, in the Jabal Sinjar range its stands have been reported from an elevation of 700 - 1300 m.

In European Turkey the northern limit of the range of *A. foetida* cuts the northern part of the Gallipoli peninsula. From there the line of the range extends along the shores of the Aegean to western Anatolia and then with smaller or larger gaps it runs along the shores of the Mediterranean to the vicinity of Maraş and the Amanus Mts. Still further to the

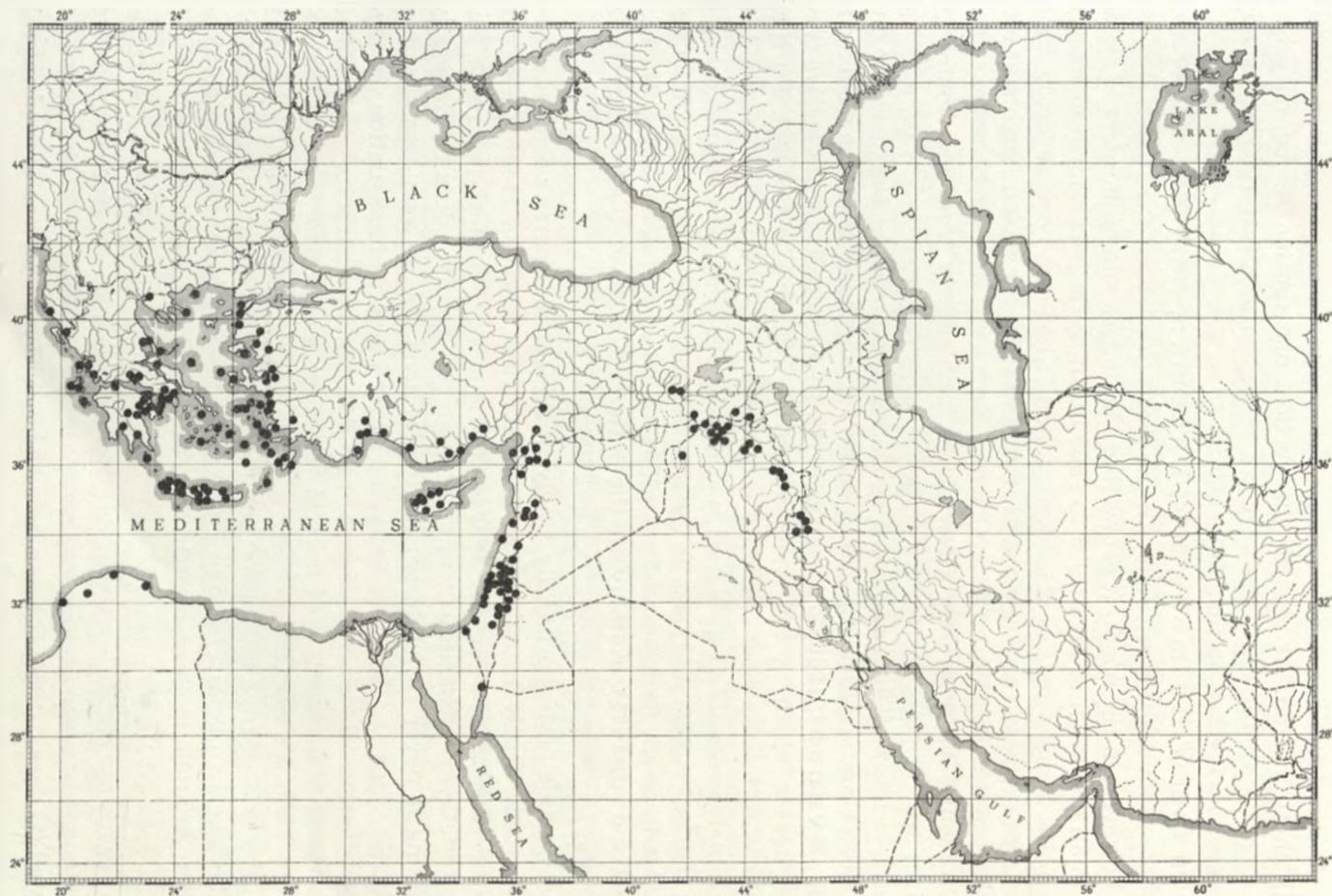


Fig. 1. The distribution of *Anagyris foetida* L. — eastern part of the range  
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east, after a gap of about 450 km. *A. foetida* can be found on infrequent stands in vilayet Siirt and Hakkari. These latter stands are linked directly with those in Iraq. As regards the vertical distribution *A. foetida* grows in Anatolia almost from the very sea shore up to about 1000 m, usually however no further up than 500 - 600 m.

On Cyprus (Holmboe, 1914; Chapman, 1949) *A. foetida* occurs rather frequently particularly in the western parts of the island, it is rare, however, in the north. It grows there in hedges and on borders of fields up to an elevation of about 900 to 1000 m. In Syria it is known primarily from the western part of the country, and it has also been reported from the frontiers between Turkey and Iraq, and from the Golan heights at elevations of 150 to 250 m (Karschon, Zohar, 1968). In Lebanon it has been mentioned from only a few places, particularly from the vicinity of Beirut and Tripolis. It is more frequent however from Palestine, and the southern limit of the continuous range reaches Israel in Northern Negev, between Gaza and Beersheba and in the Judean Mountains (Oppenheimer, Evnari, 1940; Zohary, 1973). In Jordan *A. foetida* grows furthest to the south in the Ammon province (Nábělek, 1923). Further south still, but by now scattered sporadically are the stands observed in the Sinai peninsula (Täckholm, 1974) on the Mediterranean and along the Gulf of Aqaba and also in the southwestern parts of the Arabian peninsula in Saudi Arabia and Yemen (Blatter, 1921; Khattab, Nabil El-Hadid, 1971). Notably in the latter country. *A. foetida* has been found at an elevation of as much as 2800 m.

*A. foetida* occurs primarily singly in thickets or sparse deciduous forests, particularly in oakwoods on devastated land, on mountain slopes and on various types of marginal land, frequently on limestone rocks, but also on clayey substratum, sand and even on coastal dunes. Generally speaking it never forms larger agglomerations nor its own communities, and only Guest (1966) has described in Iraq a special association *Anagyretum foetidae*. This association is only of secondary character — it formed as a result of destruction of natural communities by man. Guest has observed such an association near a place called Dohuk, where the only shrub was *A. foetida* (50 - 60%) and the major component of an association of herbaceous plants *Plantago lagopus*. *A. foetida* forms also larger thickets in Anatolia in Bergama (Browicz, Zieliński, *in observ.*).

In view of the unpleasant smell and the toxic properties of the fruits and leaves the shrub is unpalatable for animals and therefore can survive in intensively grazed regions where other species of shrubs have been eradicated (Guest, 1966; Chamberlain, 1970). *A. foetida* proved useful in folk medicine, and its medicinal properties have been known from centuries. A brew from the seeds has been used as a vulnerant in Palestine in recent times (Townsend, 1974).

## LOCALITIES

**Greece.** Lesvos; Chios: Hügel westlich der Stadt (Rechinger, 1943a); Khios, 240 m. Platt 27 (Chamberlain, 1970a); Samos: Zwischen Vathy und Kap Kotiskas, Rechinger 3416; Ambelos, 600 - 800 m, Rechinger 2125; Pyrgos und Karlowasi; Ikaria: Hag. Kirykos und Thermen; Phurni; Leros (Rechinger, 1943a); Kalimnos (Chamberlain, 1970a); Kos: Aklepeion u. M. Dikāos (Rechinger, 1943a); Kos, 10 m, Davis 40443 (Chamberlain, 1970a); Nisiros: Hagios Zacharias, Mandrakion (Papatosu, 1975); Tilos (Rechinger, 1943a); Khalki, below cliffs, 600', 5.5.1964, Gathorne-Hardy 790 (Chamberlain, 1970a); Rhodos: Malona, nidere Macchie (Finkl, 1961 - 1962); Rhodos, zwischen Faenz und Salakos (Rechinger, 1943a).

**Turkey.** Yalova, 1923, Ingoldby (Rechinger, 1943a); Anafarata Liman (Webb, 1966); Jam Baz, Ingodbly 193, 227; Suvla, Kett 1429 (Rechinger, 1943a); Iter Trojanum: Thymbara, 3.1893, Sintenis 235 (E.); Troas: sehr verbreitet; ad Adramit (Rechinger, 1943a); Balikesir: SW of Burhaniye, near Pelit, rocky slope over sea, 7.5.1975, Browicz, Zieliński 78 (KOR.); Izmir: Bergama, slope of Akropolis, 7.5.1975, Browicz, Zieliński 87 (KOR.); At the foot of Manisa Dagi, 20.3.1967, Baytop 10679 (E.); Izmir: Bayrakli, bottom of valley; NE Bornova, environs of Nedelkenkoy, 200 m; Tahtali Dag above Bunarbasi, 50 - 70 m (Zoahry, 1973); Izmir: Kemalpaşa, Dereköy yakini, 300 m, 27.4.1958, Kayacik, Yaltirik 645 (E.); Izmir: Kemalpaşa, Karabel, near the bas-relief of Karabel (Etia Baba) 25.5.1966, Alava 4741 (E.); In sepibus Smyrnae, 1827, Fleischer (E.W.); Cimetière des Juifs, Smyrne, 20.3.1854, Balansa 218 (C.W.); Ad Smyrnam, 1858, Unger (W.); Ad Smyrnam, in regione callida vulgaris, prope Ilidja, Bornmüller 9241 (Bornmüller, 1908); Izmir-Torbali, 23 km nach Izmir, 120 m, 28.5.1969, Simon 69 - 126 (Huber-Morath, 1973); Izmir: Kusadasi, 30 m, 8.4.1965, Davis 40703 (E.); Kusadasi Söke, Cistus-Macchie, 10 km nach Kusadasi, 200 m, 4.6.1967, Huber-Morath 17595 (Huber-Morath, 1973); Izmir: Efes, 23.3.1967, Baytop 10734 (E.); Selçuk-Efes (Birand, 1952); Samsun Dag (nordabdachung) auf der Halb. Mycale: Sarikaya-Tal, 800 m südlich der Küste (Meyer, 1969); Mugla: Eskihisar, 20.5.1967, Baytop 11132 (E.); Northern slopes of Bodrum (Halikarnas) Peninsula, Demir Ciftligi (Peşmen, 1966); Lycia: montibus supra Phaselis (=Tekirova) (Tchihatcheff, 1866); 42 km of Antalya, on the road to Korkuteli (in the junction of Thermessus), 21.2.1966, Baytop 8488 (E.); Antalya: 2 - 3 km N of Village Dag, S of cross-road Antalya-Korkuteli, calcareous rocks, 900 m, 10.5.1975, Browicz, Zieliński 113 (KOR.); Antalya, 30 m, 1936, Tengwall (Huber-Morath, 1943 - 1946; Chamberlain 1970a); Antalya: Side, 10 m, Sorger (Herb. Sorger); Antalya: Alanya Kalesi 25.2.1966, Baytop et all. 8564 (E.); İçel: Mut-Magras Dag, 1300 m, 11. 5. 1965, Coode, Jones 828 (E.); İçel: 25 miles S of Mut on road to Silifke, 15.5.1965, Coode Jones 1058 (E.); Silifke-Mut, W of Degirmendere, near road, 14.5.1975 (Browicz, in obs.); İçel: 27 km E od Silifke, Sorger (Herb. Sorger); Mersin, dünen, 10 m, 2.1895, Siehe 8 (E.W.); Mersin: gorge of Tarsus river, between Ulaş and Şamlar, 150 m, 5.4.1957, Davis 26441 (E.); Armenia turcica, ad oppidum Maraş, Nabélek 3030 (Nabélek, 1923); Kurd-Dagh (Post, Dinsmore, 1932); Amanus: Belian, Kirikhan, Staph (PR.); Pr. Beilan, 2000', Haussknecht (W.); Distr. Bitlis. In lapid. inter vicum Zoch et fl. Haso Su, substr, cals., ca. 800 m, 15.8.1910, Handel-Mazzetti 621 (W.WU.); Siirt: 35 from Siirt to Baykan, 800 m, 18.5.1966, Davis 43110 (E.); Diyarbakir: Veyzel Garani, 890 m, Yaltirik ISTO 10000 (Yaltirik, 1973); Mardin: Foot of Kasrik gorge, 9 km from Cizre, 350 m, 7.5.1966, Davis 42660 (E.); Hakkari: Beytişebap and Çukurca, acc. to K. Sevim (Yaltirik, 1973).

**Cyprus.** Kannaviu near Khulu (Holmboe, 1914); Paphos: Ayos Nikolaos, Chapman 365 (Chapman, 1949); Trodos-mountains (Holmboe, 1914); Chrysogrogitissa, 3000', 11. 5. 1941, Davis 3417 (E.); Ad Chrysostomo, 2500', Kotschy 696 (W.); Pera-pedhi, Kefkalla Hills, 2200', 2. 5. 1962, Meikle 2799 (C.); Hag. Pantaleimon, north of

Morphu (Holmboe, 1914); Lapithos, in declivi sicco (Lindberg, 1946); Lefkara, 2000', 19. 3. 1941, Davis 2733 (E.); Ad rivulos pr. Riatiho Cerginia, 28.5.1880, Sintenis, Rigo 669 (WU.).

**Iraq.** In lapidosis montium Dschebel Sindschar supra opp. Sindschar, 700 - 1300 m, substr. calc., 9.6.1910, Handel-Mazzetti 1461 (W.); Oak forest near Zakho, 14. 4. 1952, Regel 61 (W.); Ad confines Turcicae prov. Hakkari, ditione oppidi Zakho, substr. calc. In quercetis jugi a 8 km a Zakho merid. versus, 2 - 4. 7. 1957, Rechinger 10673 (W.); Zakho valley, Guest 2263; Jabal Bekhar, Rawi 23024 (Townsend, 1974); Hillside and banks. Dohuk in Mosul Liwa, 17. 3. 1956, Polunin 58 (E.W.) Dohuk, 18. 5. 1957, Wheeler Haines 1023 (E.), Dohuk, Guest 2291; Between Dohuk and Suwara Tuka, Guest 1328; Speeris NE of Dohuk, Alkas 18654 (Townsend, 1974); Loam of hillside 6 km W of Dohuk, 21. 3. 1963, Barkley 4643 (W.); Jabal Maklub, 17. 3. 1958, Wheeler Haines (E.); Zawita, Guest 4440.4799.4894; Omar (Townsend, 1974); Shaikh Adī near Ain Sifni, 13. 6. 1934, Field, Lazar 711 (W.); Frequens ad pagum Mar Jakob ad septentr. ab oppido Mosul et in valle „Sapna“ inter pagos Zacho (Azach) et Amadia in declivitate siccis usque ad alt. ca. 1200 m (Nábélek, 1923); Hillsides — Kara Dakh, 4000', 22. 5. 1961, Stutz 1401 (W.); Distr. Serizor: colles aridi ad pagum Der Harir inter Erbil et Rewanduz, ca. 650 - 700 m, 21. 5. 1910, Nábélek 3031 (Nábélek, 1923); Kurdish Hill near Shaqlawa, 3000,? no. 195 (W.); In montis Kuh Sefin, reg. inf. supra pagum Schaklava (dit. Erbil), 900 m, 11. 5. 1893, Bornmüller 1061 (PR. W. WU.); ibid. 1000 m, 4.6.1893, Bornmüller 1060 (W. WU.); Mountain valley N. of road Salahaddin-Shaqlawa, 820 m, 10. 9. 1973, Izdyorek, Wiszniewski 59 (KOR.); Hillside, W of Salahaddin, 500 m, rare, 1967, Anders 1045; 51 km NW of Sulaimaniya, Rawi 21776 (Townsend, 1974); Inter Sulaimaniya et Dokan. Inter Surdash et Dohan, ca. 800 m, 14. 6. 1957, Rechinger 10126 (W.); Sulaimaniya, Graham B/14; Soldara. N side of Baranan Dagh, Poore 651; Kirkuk province, Annon. comm. Guest 3956 (Townsend, 1974).

**Iran.** Kermanshah: Shahabad-Guilanē Gharb, 18. 4. 1951, Sharif 2557 E (W.); Kermanshah: Kassēgaran, 1200 m, 1. 5. 1948, Behbudi 71 (W.); Kermanshah: Shalan-Dalahu, 1020 - 1800 m, 25. 6. 1967, Iranshahr, Terme 12389 E (W.); Kermanshah: Rijab. Sarab-e Eskander, 22. 6. 1968, Iranshahr 13299 E (W.).

**Syria.** Bords du Tigre, vers le Pont Romain — Haut Jeziré (Mouterde, 1970); Reg. infer. du Djebel Seman, 1200', 15 - 20. 5. 1908, Haradjian 2031 (W.); Babeska (Post, Dinsmore, 1932; Mouterde, 1970); Alepp,? (E.); S. de Harim; Jisr-ech-Choghour; Bserine; Homs a Tell Kalakh; Riblah; Ouadi-el-Qarn (Mouterde, 1970); Gebel-eš-Sech (Hermon), supra pagum Baniyas (Cesarea Philippi) 500 m, 25. 4. 1909, Nábélek, 3028 (Nábélek, 1923); Common on the northeren slopes of Wadi Semakh, at alt. 150 - 250 m (Karschon, Zohar, 1968).

**Lebanon.** Akkar. Qoubbayat; Tripoli (Mouterde, 1970); Beirut, 5. 1871,? (E.); Be-yrouth; vers 'Ain Ebel (Mouterde, 1970).

**Israel - Jordan.** Upper Galilee, between Kerem Ben Zimra and Alma, loose maquis, 18. 6. 1957, Lorch, Grizi 637 (C.E.W.); Safad, 100 m, 1. 3. 1911, Dinsmore 4616 (E.); Wadi Tawahin (Safad), 3. 5. 1942, Davis 4591 (E.); Mt. Tabor, sommet, 10. 6. 1907, Aaronshon 4059 (Oppenheimer, Evenari, 1940); Acco Plain: Mt. Gilboa (Zohary, 1972); Lower Galilee in Shimron, 200 m (Zohary, 1973); Carmel, Aaronshon 4057; Samaria: environs de Zircon Jacob, 26. 2. 1916, Aaronshon 4055; Saron: Hadera, 15. 3. 1905, Aaronshon 4062; Saron: Nahr el Auja, 1. 2. 1906, Aaronshon 4061; Négeb: east of Gaza, direction to Bir Seba (Beer Sheba), 4. 3. 1915, Aaronshon 4058 (Oppenheimer, Evenari, 1940); Gaza (Post, Dinsmore, 1932); Ramaleh, 1863 - 64, Lowne (E.); Jerusalem: Saint-Croix, 2. 1889, Jouanard-Marie 308 (W.); Jerusalem: Bab el Wad, 1881 Paulus (WU.); Prope Hebron, 1855, Kotschy 1361 (W.) Wadi Yarmuk, 200', 28. 4. 1942, Davis 4629 (E.); Crusader castel in Ajlun, ca. 975 m, on walls, 11. 5. 1955, Kasapligil

2709; Salt distr. Wali Zerqa bridge, 200 m, 5. 1. 1955, Kasapligil 1850 (Kasapligil, 1956); Jabal Asha (Jab. Awsha near us-Salt), 30. 4. 1911, Meyers, Dinsmore 616 (E.); Ain-es-Sunei in Wadi Ġeria inter Jericho et Arak-el-Emir, ca. 300 m, 15. 4. 1909, Nábélek 3029 (Nábélek, 1923); Wady el Maleh, — 200 m (Rechinger, 1952b).

**Egypt.** At Rafah, coastal region of Sinai, 22. 3. 1928, G. Täckholm (Cairo Herbarium — V. Täckholm, 1977, in litt.); At El Mahash el Maseridi, Sinai, 11. 6. 1927, Kaiser 779 (G.W.).

**Saudi Arabia.** Hedjaz, Abha, Aziza, on rocky ground, 22. 5. 1944 (Khattab, Nabil El-Hadidi, 1971); Balad Ghamid, 1970, Ghamidi, Quasim 113 (Cairo Herb. — V. Täckholm, 1977, in litt.).

**Yemen.** Near Sanah, 2800 m, Defl. 485 (Blatter, 1921).

## 2. CALYCOTOME VILLOSA (POIRET) LINK

The genus *Calycotome* has been monographically described twice. Rothmaler (1949) has recognized within it 5 species: *Calycotome spinosa* (L.) Link, *C. villosa* (Poir.) Link, *C. infesta* (Presl.) Guss., *C. fontanesii* Rothm., and *C. rigida* (Viv.) Rothm. They all occur within the Mediterranean basin, in North Africa, southern Europe and in the western parts of southwest Asia. Twenty years later a second revision of the genus has been conducted by Gibbs (1968), who came to the conclusion that the genus *Calycotome* is represented not by 5 but only by 2 species: *C. spinosa* and *C. villosa*.

The range of *C. spinosa* covers the western part of the Mediterranean — southeastern Spain, southern France, northwest Italy, Sardinia, Corsica the Balearic Is., and northern Algeria. Gibbs has recognized three varieties in *C. villosa*, namely — var. *villosa*, var. *rigida* (Viv.) Béguinot and var. *intermedia* (Presl.) Ball. This last variety is restricted in its range to Morocco, Algeria and southern Spain. A somewhat greater range is that of var. *rigida*, reported from northwestern and southern Italy, from Yugoslavia (Dalmatia), Tunisia and northern Libya. However, the greatest range is that of the type variety — var. *villosa*. It extends from southern Spain and Morocco in the west to Jordan in the east, except southern France, northeastern Spain, southern Italy and Yugoslavia. Thus in southwestern Asia *C. villosa* is represented only by the type variety. Gibbs (l.c.) has published a map of distribution of *C. villosa* and its varieties, however, he has excluded on it southern Turkey, Syria, Lebanon, Israel, Jordan and Cyprus, even though he has listed the stands in the area on the basis of herbarium specimens\*. A point map for Anatolia has been published by Gibbs in 1970 in the "Flora of Turkey".

In southwestern Asia the range of *C. villosa* (Fig. 2), similarly as that of *Anagyris foetida* is restricted exclusively to coastal regions and to the Islands of the Aegean bordering on Anatolia. This shrub as can be judged

\* In his revision Gibbs has also ignored the small flowered var. *parviflora* Bornm. recognized as a distinct variety by Bornmüller (1917).

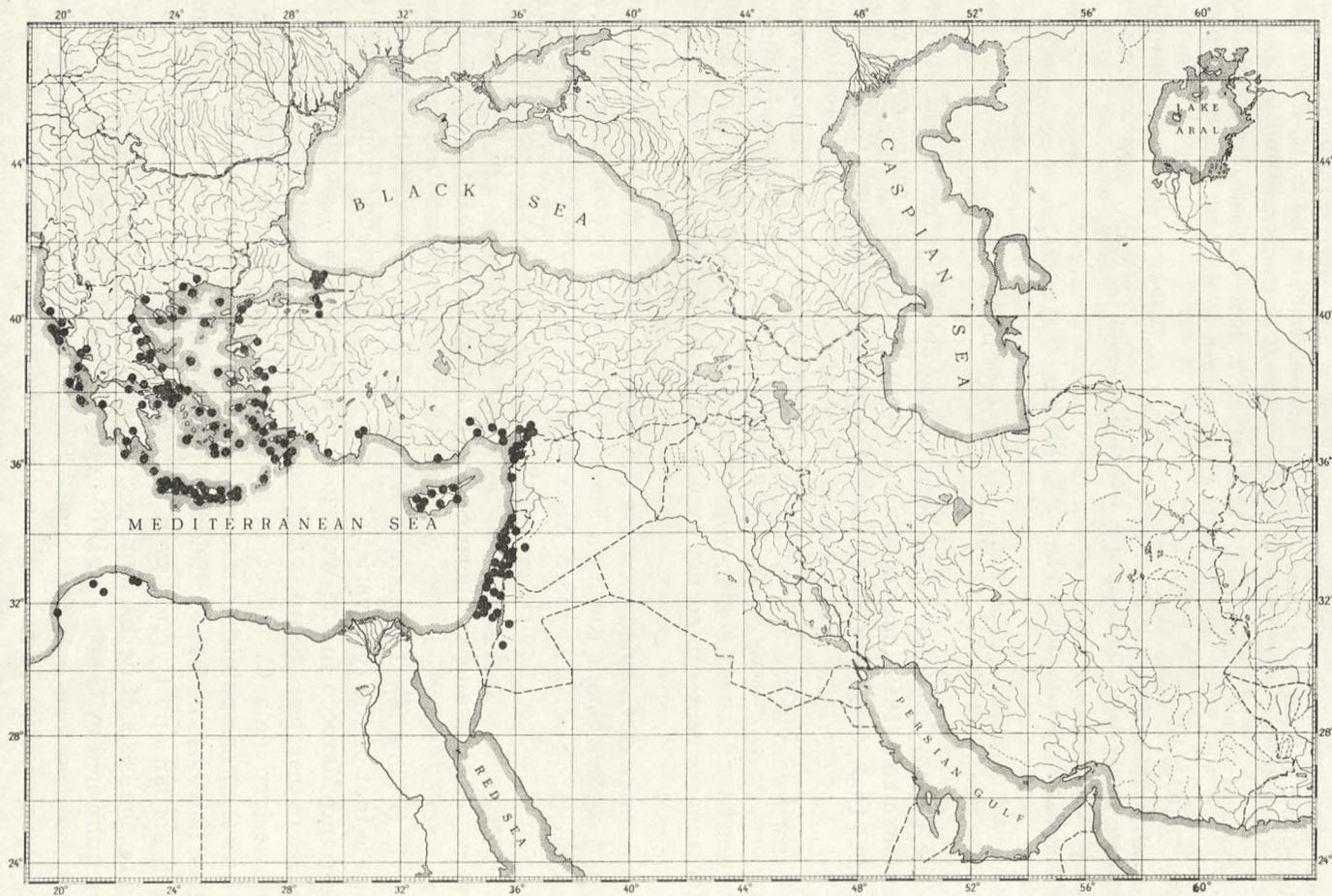


Fig. 2. The distribution of *Calycotome villosa* (Poiret) Link — eastern part of the range

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from the available data is not very common here and occurs only sporadically, almost from the sea shore to an elevation of about 1120 m (Amanus Mts.) usually however no further up than 600 - 700 m. It grows in insolated and dry places, usually on rocky slopes in macchia communities, and also in sparse pine forests, more commonly only in the Izmir region. The most northerly stand can be found in European Turkey north of Istanbul, between Sariyer and Kilyos.

According to Holmboe (1914) and Chapman (1949) it is a common shrub almost throughout Cyprus. In western Syria only infrequent stands of its are known, and the most elevated ones occur on the Golan heights, northern slopes of Wadi Hishaba, at 800 - 900 m elevation (Karschön, Zohary, 1968). In the neighbouring Lebanon, particularly in the northern and central part, *C. villosa* is not a rare species and occurs primarily in degraded forests, even at considerable elevations, up to 1740 m (Beals, 1965).

Further still to the south *C. villosa* occurs in northern Israel and in western Jordan. According to Zohary (1972) in Mediterranean Palestine it is the most common species of shrub, which in some communities is the dominant plant. The most southerly stand of *C. villosa* is known from southern Jordan, from an association of *Cupressus sempervirens*-*Juniperus phoenicea*, on Jebel Sarab around Rashadiye, 30°42' N, 35°35'20" E (Zohary, 1973).

#### LOCALITIES

**Greece (Asiatic part).** Lesvos: Kalkhügel b. Mytilene, Rechinger 1240 (Rechinger, 1943a); Psara (Greuter, 1976); Chios: Hügel westl. d. Stadt (Rechinger, 1943a); Samos: Malagari pr. Vathi, 29. 3. 1934, Rechinger 3374 (W.); Samos: Kap Kotsikas, Kap Colonna, Karlowasi; Ikaria: H. Kirykos, Rechinger 2226, 4343; Ikaria: M. Atheras, 500 m; Leros: unterhalb Hag. Chircos; Telandos; Kos: Antimachia (Rechinger, 1943a); Nisyros (Papatosu, 1975); Tilos, Simi (Rechinger, 1943a); Khalki (Tchihatcheff, 1866); Rhodos: Calitea, phrygana (Finkl, 1961 - 1962); Rhodos: Mirmare beach nr. Rhodos, 21. 3. 1965, Davis 40273 (Gibbs, 1968); SW of town Rhodos, ca. 28 km, direction to Lindos (Lavrentides, 1969); Rhodos: Zwischen Villanova u. Faenza; Casa dei Pini; Peveragno (Rechinger, 1943a).

**Turkey.** Kilyos, Sorger 64-4-14 (Gibbs, 1970); Circa Byzanthium, supra pagum Sari Yar, in collibus in macchia, rarior (Czeczott, 1939; Webb, 1966); N. of Sariyer, road to Kilyos, S. slope, 3. 5. 1975, Browicz, Zieliński 11, 12 (KOR.); Altin Kun in Bosphoro (Regel, 1942, Candollea 9); Constantinopel, Noë (W.): Umgebung v. Constantinopel: Allah-Tepe, 23. 4. 1902, ? (WU.); Rumelikavagi (Webb, 1966); Beikos, 26. 6. 1896, Nemetz (WU.); Umgebung v. Constantinopel: Dschendere, 12. 4. 1895, Nemetz (WU.); Anadolu Kavak, 1900, Schröder (W.); Copiosae inter Scutari et Cartal (Grisebach, 1843); Erenköy, 21. 4. 1883, Sintenis 271 (Gibbs, 1970); Insula Prinkipo, prope Byzantium, in macchia in silva *Pinus halepensis* sparse, substr. dolomico, 3 - 80 m, 30. 6. 1907, Handel-Mazzett 45 (W. WU.); Princes Isle (Adalar), 17. 7. 1925, Gilliat-Smith 1271; Bursa: Mudanya, 2. 4. 1934, Balls, Gourlay 615 (Gibbs, 1968); Frequens pr. Mudania (Grisebach, 1843); Ulu-Dagh (Rechinger, 1943a); Çanakkale: Geli-

bolu. Ingoldby (Webb, 1966; Gibbs, 1968); Çanakkale: 21 km nördl. von Eceabat, 10 m, 29. 5. 1966, Sorger 66 - 3-15 (Herb. Sorger); Troas (Rechinger, 1943a); Balıkesir: SW of Burhaniye, near Pelit, olive tree plantation, 6. 5. 1975, Browicz, Zieliński 73 (KOR.); Env. of Manisa, 330 m; Env. of Naldenkoy, EN of Bornova, ca. 200 m; Env. of Izmir: Tahtali Dag above Bunarbasi, 50 - 70 m (Zohary, 1973); Armutlu bei Gemlik (Demiriz, 1969): Smyrne, sur les colline incults, 1854, Balansa, 195 (W.); Izmir: Tor-bali-Ephesus, 22. 3. 1956, Davis, Polunin 25165 (Gibbs, 1968); Nordabdachung des Samsun Dag, auf der Halb. Mykale: Küçük Kalamaki (Meyer, 1969); Kalamaki-Bay (Rothmaler, 1949); Northern slope of Bodrum (Halikarnas) Peninsula, Demir Ciftlingi (Peşmen, 1966); Mugla: Cumali-Resadiye, 17. 4. 1965, Davis 41258; d. Marmaris: Ordu-gah, 10. 7. 1960, Khan et all. 8 (Gibbs, 1968); Köycegiz: Maki Belt (Karamanoğlu, 1962); c. 10 ml. NE of Kalkan, 13. 5. 1964, Jackson 5066 (Gibbs, 1968; Antalya: Konya Aiti westlich von Antalya, Strandfelsen, 23. 5. 1963, Sorger 63-26-10 (Herb. Sorger); Antalya: Bahceil Evler, 7. 4. 1959, Nijhoff; E of Antalya, 15. 3. 1936, Tengwall 112 (Gibbs, 1968); İçel: Gilindire, 50 m, Markgraf (Gibbs, 1970); Gysel Dere, 3. 1895, Siehe 25 (WU.); ad Mersina (Boissier, 1872); Aydos Dagli, 9. 1965, Yaltirik 3327 (Gibbs, 1968); Adana Plain, foothills of the Taurus Mts. (Zohary, 1973); Adana-Ceyhan, 3. 5. 1965, Coode, Jones 356; Karatas, 1. 5. 1965, Coode, Jones 265 (Gibbs, 1968); Am Fuss des Amanus bei Osmaniye, ca. 280 m, Macchie (Wagenitz, 1963); Seyhan: d. Bahce, Haruniye-Fevzipasa, 18. 4. 1957, Davis, Hedge 26768 (Gibbs, 1968); Gaziantep: 8 km W of Fevzipasa, 900 m, Huber-Morath 13504 (Gibbs, 1970); Kurd-Dagh, 9. 1891 Post (Post, Dinsmore, 1932); Alexandrette, Bornmüller 81 (Bornmüller, 1917); Entre Alexandrette et Aintab. 1 - 3000'. 15 - 20. 3. 1910, Haradjian 3983 (W.); Hatay: Amanus Mts., ca. 1200 m, 20. 8. 1975, Wiszniewski, Izydorek 9 (KOR.); Amanus (Akman, 1973); Environs of the village Payas, near Iskanderun (Zohary, 1973); Hatay: 5 mls towards Belen from Antakya, 6. 5. 1965, Coode, Jones 529 (Gibbs, 1968); Antiochia (Bornmüller, 1917); Alexandrette to Baylan (Post, Dinsmore, 1932); Amanus Mts., descent from Seldrin, to 620 m (Zohary, 1973); Zwischen Seldiren-Pass und Bitias, 600 - 700 m, 27. 8. 1931 (Feinbrun, 1934).

**Cyprus.** Stavros, Paphos Forest, 12. 4. 1933, Foggie 186; Platres, 9. 12. 1936, Kennedy 546 (Gibbs, 1968); Kalkopetria, ad viam ad mt. Trodos (Lindberg, 1946); Peristerges near Kilanemos, 3. 4. 1962, Meikle 2428; Kyrenia Pass, 3. 1902, Lascelles (Gibbs, 1968); In campo arido juxta oppidum Kyrenia (Lindberg, 1946); Koronia (Chapman, 1949); n. village Hagia Napa, near SE edge of the island, 15 - 20 m (Zohary, 1973); Stavrovuni: Hag. Napa (Holmboe, 1914); In monte St. Croce, copiose, 1000', 1862, Kotschy 879 (W.).

**Syria.** Jebel Alouites, 300 m, about 20 km of Latakia (Zohary, 1973); Lattaquia int.: Bhmara, ca. 350 m, Haradjian 2930 (Rechinger, 1959); Hammé, Banias (Mouterde, 1970); Gebel-es-Sech (Hermon) supra pagum Banias, ca. 700 m, 26. 4. 1909, Nábélek 3001 (Nábélek, 1923); Golam: Jeraba, Yehudiyeh; Between Notera and Kh Azazyateh; Northern slopes of Wadi Hoshaba, 800 - 900 m (Karschon, Zohar, 1968).

**Lebanon.** Tripoli (Mouterde); Mts. near Tripoli, 100 - 300 m, calcareous rocks (Zohary, 1973); Ehden, 1480 - 1600 m; Tannourine, 1600 - 1740 m; Hadeth, 1550 - 1575 m (Beals, 1965); Entre Rayfoun et Faraya, dans le Kesrouan (Rechinger, 1959); Douhour Choueir, 1200 m, (Zohary, 1973); Mairouba, in pineto sicco, 1100 m, Samuelsson 2137 (Rechinger, 1959); Salima; Bikfaya (Mouterde, 1970); Beyrouth, 1850, Blanche (W.); Araya nr Beyrouth, 4. 4. 1959, Polunin 5201 (Gibbs, 1968); 9 km a Beirut orientem versus infra Yamhour, 24. 5. 1957, Rechinger 13353a (W.); Jamhour, 'Aley; Saïda; Bir Hassen; Entre Saïda et Joun; 'Abej; Hasbani; Sarada (Mouterde, 1970); Broumana, 4. 6. 1952, Mooney 4475; Ajlatun, 1. 4. 1956, Philby (Gibbs, 1968).

**Israel - Jordan.** Meiron Mt.; Coastal plain betw. Tel Baruch — Zahala, 30 - 50 m; Lower Galilee, desc. to Wadi Hamam, facing Migdal on the way to Marar,

130 m; Mt. Carmel, env. of Usifa, 200 - 250 m (Zohary, 1973); Mt. Carmel (Post, Dinsmore, 1932); Macchie an oberen Nordosthang des Karmel bei Jadschul, 250 m; WSW Hang des Karmelrücken bei 400 m 8 km südl. Haifa (Rikli, 1943 - 1948); Lower Galilee, env. of Tivon, 210 m (Zohary, 1973); Samaria: Zircon Jacob, 5. 6. 1907, Aaronshon 4084 (Oppenheimer, Evenari, 1940); Genin distr., village Seer, 14 km SE of Genin, Abu-El-Ubbeyt, ca. 500 m, 2. 12. 1954, Kasapligil 1739 (Kasapligil, 1956); Saron: Hadera, 15. 2. 1905, Aaronshon 4082 (Oppenheimer, Evenari, 1940); Samaria: Mt. Heter, 175 m, near Bath Shlomo (Zohary, 1973); M. Ebal (Har Eival), 22. 12. 1910, Dinsmore, Meyers 4584; Jaffa (Yafo), 10. 3. 1911, Dinsmore, Meyers 6584 (Gibbs, 1968); Coastal belt, hills near Rehovot (Zohary, 1973); Latrun (Post, Dinsmore, 1932); Jerusalem distr. Ramallah, Um Safa, ca. 600 m, 5. 4. 1955, Kasapligil 2446 (Kasapligil, 1956); Jerusalem: Saint-Sabas, 1889, Jouneannet-Marie (W.); Jerusalem, Dinsmore, Meyers 584 (Gibbs, 1968); Inter rupes ad En-nebi Samwil dit. Hierosolymae, ca. 850 m, frequens, 26. 3. 1909, Nábélek 3000 (Nábélek, 1923); Ain Karim umweit Jerusalem, 700 m, Wall (Rechinger, 1952b); Kiriath-Anavim nr Jerusalem, 30. 3. 1931, Amdursky 134 (W.); Mer Morte: Ain el Feskha, 17. 3. 1904, Aaronshon 4085 (Oppenheimer, Evenari, 1940); Majdal (Post, Dinsmore, 1932); Judea, supra mare Mortuum (Boissier, 1872); Judean hills near Maoz-Zion, 250 m; Judean Mts. near Ramat Raziel, 650 m (Zohary, 1973); Salt distr., Ardah road, ca. 880 m, edge of *Quercus coccifera* forest, 9. 1. 1955, Kasapligil 1888 (Kasapligil, 1956); Moab (Post, Dinsmore, 1932); Jebel Sarab, n. Rashadiya, at a point betw. 30°42' N, 35°35' 20" E, 1400 m, ass. *Cupressus sempervirens-Juniperus phoenicea* (Zohary, 1973).

### 3. ANTHYLLIS HERMANNIAE L.

The range of this small thorny shrub, which attains 50 - 80 cm at the most, occurs primarily in the Aegean Is. and on Crete. For this region a detailed point map of stand distribution has been published by Runemark (1969). Further to the west *A. hermanniae* occurs also on infrequent stands in Greece (coastal regions), in southeastern Albania, in southwestern Yugoslavia (only in Montenegro near Cetinje), in southern Italy, and also on Sicily, Malta, Sardinia, Corsica and the Balearic Is. The most northerly stand occurs on a small island Gorgona, located northeast of Corsica, at latitude 43°25' N. North of the Aegean Islands infrequent stands are known in the southeastern Greece in the vicinity of Thessaloniki and in Thrace.

The eastern limit of the range of *A. hermanniae* is attained in western Anatolia and on the Island of Rhodos (Fig. 3). In Anatolia stands are infrequent and distributed exclusively on coastal regions. It can be expected however that in the future further stands of this species will be found since this species has not been the subject of detailed chorological studies in Turkey before.

The general range of *A. hermanniae* has been presented with the help of a line map twice by Rikli (1953 - 1948), these maps differing from each other in some details. Rikli has not known about the occurrence of this species on the Balearic Is.

In Anatolia it grows almost from the sea level to about 400 m. The fur-



Fig. 3. The distribution of *Anthyllis hermanniae* L. — central and eastern part of the range  
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ther to the west, however, the further up are the stands located. Thus on Levkas Is. *A. hermanniae* can be found at 500 m (Hofmann, 1968), on Euboea up to 550 m (Rechinger, *in sched.*), on Crete and in Albania up to 600 m (Rechinger, 1943b; Mitrushii, 1966), in Yugoslavia up to 700 m (Rikli, 1943 - 1948), in Greece, in Attica on Mt. Parnas up to 720 m (Merxmüller, Podlech, 1967) and on Corsica up to 1600 - 1700 m (Briquet, 1913; Rikli, 1943 - 1948). Thus on the latter island it behaves as a mountain species.

#### LOCALITIES

**Greece (Asiatic part).** Lesvos: Kalkthügel bei Mytilene, Rechinger 1236 (Rechinger, 1943a); Psara (Greuter, 1976); Khios; Ikaria: Hag. Kirykos, Rechinger 4236; Ikaria: gegen Hag. Nikolaos; Samos: Marathokampos, Vathy, Kap. Colonna, Kap. Kostikas (Rechinger, 1943a); Samos: E. of Tigani, Gathorne-Hardy, 656 (Cullen, 1970); Fournoi; Leros; Kos: Antimachia und Kephalos (Rechinger, 1943a); Yiali (Papatsou, 1975); Rhodos: Trianda; M. Philermos; Bucht von Kalitea; Vathy, Rechinger 7527; Lindos. Jannadi; Cattavia (Rechinger, 1943a); Rhodos: Calitea — phyrgana; Mte. Profeta — *Pinus-Cupressus* wald (Finkel, 1961 - 1962).

**Turkey.** Constantinopol, Noë (W.); Ad Bosphroum, Clementi (W.); In agro Byzantino ad cacumen collium Boulgourlou et Tschamlidscha supra Skutari Anatoliae, 17. 6. 1890, Degen (W.); Camlica, 1. 7. 1918, Post (Cullen, 1970); Gallipoli: Kilia, Kett 30; Andagere, Ingoldby 364; Maidos, Ingoldby 207 (Rechinger, 1943a; Cullen, 1970); Çanakkale: Macchie am Meer beim Tusan-Hotel Truva, 18 km südlich von Çanakkale, 23. 6. 1964, Huber-Morath 17167 (Huber-Morath, 1973); Çanakkale: Küste S. Kilitbahir, 5. 5. — 8. 6. 1968, Bauer, Fitz Spitzenberger 2975 (W.); Troas, Hedenborg (Rechinger, 1943a); Balikesir: SW of Burhaniye, near Pelit, rocky slope over sea, 7. 5. 1975, Browicz, Zieliński 74.76 (KOR.); Balikesir: Ayvalik, 25. 5. 1969, Spitzenberger 598 (W.); Manissa: Soma-Kirkagac, *Quercus* macchie, 5 km süd.-östlich von Soma, 140 m, 25. 6. 1964, Huber-Morath 17168 (Huber-Morath, 1973); Izmir: Hügel NE von Bornova, 26. 5. 1969, Fitz, Spitzenberger 614 (W.); In fruticetis Smyrnae, 1827, Fleischer (W.); In declivitatibus aridis calidis "Kuru tepe" montis Takhtali-dagh, 2 - 400 m, 26. 5. 1906, Bornmüller 9237 (W.); Coteaux calcaire bordant la route conduire de Smyrne à Boudja, 5. 1854, Balansa, 196(W.); In collibus pr. Burnabad (Bornmüller, 1908); Izmir: Cesme to Sifne, 30 m, Davis 41853 (Cullen, 1970); Izmir: Selcuk, 17. 5. 1963, Sorger 63-13-13 (Herb. Sorger); Kuşadasi-Selcuk, 27. 5. 1935, Reese (Huber-Morath, 1943 - 1946); Izmir: Kusadasi, Runemark, Snogerup 20013 (Cullen, 1970); N Kusadasi, 20 m, 1. 7. 1967, Sorger 67-43-23 (Herb. Sorger); Kusadasi-Söke, *Pinus brutia*-Gehölz, 11 km nach Kusadasi, 210 m, 4. 6. 1967, Huber-Morath 17543 (Huber-Morath, 1973); Nordabdachung des Samsun Dagh auf der Halbinsel Mykale — Küçük Kalamaki, 200 m südlich der Küste (Meyer, 1969); Mugla: Aydin to Milas, 99 km from Aydin, 380 m, Demiriz 1930 (Cullen, 1970).

#### 4. *PODOCYTISUS CARAMANICUS* BOISS. ET HELDR.

In terms of geographical distribution *P. caramanicus* belongs to the most peculiar shrubs of southwestern Asia, in view of the great disjunction that takes place between the Anatolian and Balkan stands, a disjunction amounting to 900 km in straight line. Among other species of trees and shrubs of southwestern Asia with a similar though not always so large



Fig. 4. The distribution of *Podocytisus caramanicus* Boiss. et Heldr.

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a disjunction one can mention *Juniperus drupacea* Labill., *Eriolobus trilobatus* (Poir.) Roem. and *Teline monspessulana* (L.) C. Koch. The genus *Podocytisus* is a monotypic one.

*P. caramanicus* was first discovered in 1854 by H e l d r e i c h in southern Anatolia, in the mountains of central Taurus, in vilayet Konya, between Ermenek and Karaman (whence the name of the species). It soon turned out that the main part of the species range lies not in the region where it was first discovered but on the Balkan peninsula, in Greece, southern Yugoslavia and southern Albania (Fig. 4).

A listing of the stands of *P. caramanicus* for Greece has been first published by H a l á c s y (1901, 1908, 1912) and the occurrence in Yugoslavian Macedonia has been accurately described by E h m (1953). This last author has published in his paper both a map of distribution of stands in Macedonia and a general map of the range of the species on which he has shown the areas where agglomerations of stands are most common. A line map of distribution of *P. caramanicus* for the Balkans has been published also by F u k a r e k (1975). According to E h m (*l.c.*) this shrub occurs in Macedonia relatively frequently in the valley of the river Vardar and in the valley of its tributaries extending as far north as  $42^{\circ}12' N$  near Kumanovo (E h m, *in litt.*) and in the south as far as Demir Kapija. It is a thermo-, xero- and heliophilous species occurring in mixed forests (*Quercus pubescens* and *Q. trojana*) and also in the communities of shiblyak and abandoned vine plantations between 100 and 500(700) m elevation.

In Albania *P. caramanicus* is very rare, known only from the most southerly part of the country in district Ljaskovik, and it does not cross  $40^{\circ}30'$  of latitude N.

The Greek stands are distributed primarily in Epiros and Thessaly, in northern parts of the Peloponnesus and in northern Euboea (R e c h i n g e r, 1961). H a y e k (1927) claims that *P. caramanicus* grows also in Greek Thrace, however I do not know of any herbarium specimens from that region, nor any other literature quotations that would confirm this find. Thus on the range map Thrace has not been credited with the presence of this species.

In Anatolia itself the range of *P. caramanicus* covers only few southern vilayets — Konya, İçel, Adana and Hatay. According to C h a m b e r l a i n (1970b) this species occurs in the valley of rivers and in gorges between 300 and 1000 m elevation. In Greece, however, it can be found on higher elevations, between 400 and 1300 m. According to R e c h i n g e r (*in sched.*) in Epiros on Mt. Smolika it can even be found at 1300 - 1600 m.

#### LOCALITIES

**Jugoslavia (Macedonia).** Bei Tetovo am Fuss der Sar Planina,  $42^{\circ}05' N$ ; Im Le-penac-Tal am Rand des Beckens von Skopje,  $42^{\circ}06' N$ ; W von Kumanovo,  $42^{\circ}12' N$  (Ehm, 1977, *in litt.*); Vodno, N slope, valley of river Vardar, 200 - 300 m; Solne-Dobri



Fig. 5. The distribution of *Cytisopsis pseudocytisus* (Boiss.) Fertig  
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Dol. 400 m, valley of river Markova: Kapina-Pekolnik, valley of river Treska, 500 - 700 m, acc. to T. Soška; Gradovci-Gumalevo, 200 m; Vlachčani, valley of river Vardar, 200 m, acc. to Soška; Ržaničani, valley of river Vardar, 250 - 300 m; Venec-Gradmanska rečica, 300 - 500 m; between village Orašec and Pčina, 550 m; Near Titov-Veles, valley of river Vardar, 200 m, acc. to Soška; Ubovo, valley of river Bregalnica, 200 m; Štip-Krivolak, 600 m; between Crna reka and village Pravednik, 550 m; Kavadarci-Luboš, Beginište, Reslava, Vataša, 100 - 200 m, acc. to Soška; Bošava-Demir Kapija, 100 m, acc. to Soška (Ehm, 1953).

**Albania.** Prope Vromonero et Dobra, distr. Ljaskovik, 3. 7. 1896, Baldacci 12(W.).

**Greece.** Epirus: Montes Smolika, in declivibus borealibus supra pagum Kerasovo. 1300 - 1600 m, 9. 7. 1958, Rechinger 20828(W.); Malakasi; Mt. Olympus (Halácsy, 1901); In m. Ossa: reg. media, 3000, pr. Spilaea, ad vineta, 6. 8. 1882, Heldreich (W.); In locis cultis et in dumetis prope Microchorio ad radices mt. Chelidoni, 2500', 12. 8. 1879, Heldreich (W.); Kalabaka in Thessalia, 2. 8. 1895, Formanek (W.); Kalam-paka, in montosis, 6 - 7. 1896, Sintenis (W.); Thessalia superior, in sepe supra Kalabaka, 7. 1885, Haussknecht (W.); Kastri (Halácsy, 1901); Thessalia boreali-occidentalis. In dumosis prope pagum Kastania in Pindo, 1000 m, 20. 7. 1893, Halácsy (W.); Venditsa (Halácsy, 1901); Infra vallum Suli et Sirzana, distr. Paramythia, 6. 7. 1895, Baldacci 31 (W.); Thessalia: Mons Pelion. 18. 6. 1934, Pinatzi (W.); In dumetis pr. Bralo (Baeotiae) 400 - 500 m, 30. 7. 1906, Maire, Petitmengin 428 (W.); Achaia: pr. Megaspilaeon (Halácsy, 1901.); Peloponesis (Cyllene vet.). In reg. inferiori et media montis Ziriae prope Saita (rara), 2800 - 4000', 15 - 27. 8. 1851, Orphanides 155 (W.); In monte Kyllenes Achaiae region media, prope pagum Trikala, 3500 - 4000', 30. 6. 1887, Heldrich (W.); In montibus Corinthium (Tricala), 7. 1852, Heldreich (W.); Achaia: pr. Diakophto (Halácsy, 1912); Peloponesis Achaia, prope pagum. "Kalavryta" (in collibus trans fluv. Voreikos sites) 700 m, 23. 6. 1926, Bornmüller 370 (W.); Thrace (Hayek, 1927.): N Euboea, acc. to W. Ludwig (Rechinger, 1961).

**Turkey.** Konya: Göksu Deresi between Ermenek and Sarivadi, 1000 m, Davis 16204 (Chamberlain, 1970b); Konya: In collibus apricis Tauri Isaurici in valle fluvii Djoksu inter Karaman et Ermenek, 6. 1845, Heldreich (W.); İçel: 12 km from Gülnar to Gilindre, Huber-Morath 10418 (Chamberlain, 1970b); Village de Gülek-Boghaz, près du Defile des Portes Ciliciennes. Terr. calcaire de la reg. montagneuse. 10. 7. - 19. 1855, Balansa 462 (W.) Adana: Sis to Hadjin (Saimbeyli), 5. 6. 1906, Post: Adana: Göksu gorge below Himmetli 700 - 800 m, Davis 19484 (Chamberlain, 1970b); Hatay: In dit. Ekbés, 300 m, Haradjian 655 (Rechinger, 1959; Chamberlain, 1970b).

### 5. *CYTISOPSIS PSEUDOCYTISUS* (BOISS.) FERTIG

This single representative of the genus *Cytisopsis* is an endemic species of southwestern Asia (Fig. 5). It was first described by Desvaux (1826) from the mountains of Syria within the genus *Anthyllis*, as *A. argentea* Desv., however, an identical name for a completely different species (now *A. barba-jovis* L.) has been used much earlier, in 1796, by Salisbury (Prodr. Stirp., page 332). Some years later Boissier (1843) has used for the species a new name, including it to the genus *Cornicina* Boiss., as *Cornicina pseudocytisus* Boiss. The name *Cornicina* is now treated as a synonym for the genus *Anthyllis*. A year after Boissier's diagnosis was published Jaubert and Spach (1844) have placed this taxon into a new genus *Cytisopsis*, which name stuck until today. These authors have

also used a new specific name — *Cytisopsis dorycnifolia* Jaub. et Spach, finally recombined by Fertig to *Cytisopsis pseudocytisus* (Zohary, 1972 — this change however was made already in 1970 and published in Israel Journ. Bot. 19: 294).

For several years it was believed that the range of *C. pseudocytisus* is restricted exclusively to Syria, Lebanon, Palestine, the Amanus Mts. and the central Taurus in Anatolia. Thus it was a sort a surprise when *C. pseudocytisus* was found also in western Taurus in 1931 by Guyot. It turned out that there grows a new taxon with flowers almost half as large as in the type (Fig. 6) and which was initially considered to be a form (*f. reeseana* Guyot) and was later raised to a subspecies — *C. dorycnifolia* Jaub. et Spach subsp. *reeseana* (Guyot) Huber-Mor. (Chamberlain, 1970c)\*. Thus the range of *C. pseudocytisus* consists of two parts separated from each other by about 430 - 450 km.

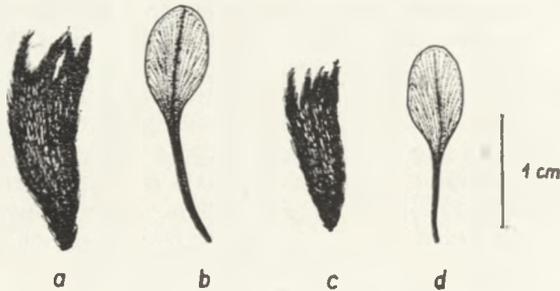


Fig. 6. *Cytisopsis pseudocytisus* (Boiss.) Fertig — calyx and standard: a-b-subsp. *pseudocytisus*, c-d-subsp. *reeseana* (Guyot) Browicz

Further discoveries of *Cytisopsis* have shown that in southwestern Anatolia there occur both the subspecies — subsp. *pseudocytisus* and subsp. *reeseana*, while in the remaining, eastern part of the range it is represented only by the type subspecies. At the moment we have an inadequate number of observations to be able to characterize accurately the subsp. *reeseana*, it appears, however, that it differs from the subsp. *pseudocytisus* not only in having smaller flowers but also smaller leaves and possibly also a smaller habit. Most probably it is a small prostrate shrub, while the type subspecies unless it has been grazed down by animals has an erect form. It appears also that in vertical distribution subsp. *reeseana* attains much higher elevations, up to 2000 m (Davis, *in sched.*), though in vilayet Mugla, in the Marmaris district it has been found even at an elevation of 200 m (Davis, *in sched.*).

\* The proper name of this taxon should therefore now read as follows: *Cytisopsis pseudocytisus* (Boiss.) Fertig subsp. *reeseana* (Guyot) Browicz, comb. nova (= *Cytisopsis dorycnifolia* Jaub. et Spach *f. reeseana* Guyot in Rev. Fac. Sci. Univ, Ist. n.s. 2,3 - 4: 13, f. 2 (1937)).

In the eastern part of the range of *C. pseudocytisus* it appears almost on the sea coast (Akman, 1973), and up to 1350 m (Huber-Morath, 1976). Further to the south it is known only from the less elevated stands, in Syria between 300 - 600 m and in Lebanon between 250 and 700 m, while on mount Carmel in Israel at an elevation of 100 m (Bornmüller, *in sched.*).

As regards the form of occurrence and the participation of *C. pseudocytisus* in plant communities we have very little information on the subject. In general it can be said that this taxon grows in exposed areas, dry and insolated, both on limestone and sandstone substratum, on rocks and on heavy clay, in steppe communities with *Juniperus*, in sparse pine forests and in various types of scrub. Davis (1949) mentions that on the top of Sandras Dag it forms "gnarled mats of silvery (much nibbled) leaves". More detailed information is provided only by Zohary (1973). According to that author in Syria, about 20 km from Latakia it occurs in an association *Pinetum brutiae humidum* together with *Erica verticillata*, *Myrtus communis*, *Genista cassia*, *Cistus creticus*, *Cotinus coggyria*, *Quercus cerris*, *Q. boissieri*, *Q. calliprinos*, *Calycotome villosa*, *Ostrya carpinifolia* while in northern Lebanon in the vicinity of Btormaz it occurs in the association *Cupressus sempervirens-Pinus brutia*. On mount Carmel (Zohary, 1962) *C. pseudocytisus* participates in the association *Pinus halepensis-Hypericum serphyllifolium*, together with such species as *Quercus calliprinos*, *Pistacia palaestina*, *P. lentiscus*, *Arbutus andrachne*, *Smilax aspera*, *Rubia olivieri*, *Genista sphacelta*, *Calycotome villosa*, *Cistus villosus* and others. In Anatolia, on the northern fringe of the Amanus Mts., about 10 - 15 km east of Osmaniye in the direction of Fevzipşa I have been collecting it in oak (*Quercus infectoria*) thickets, in which there were also the following species of shrubs: *Pistacia palaestina*, *Cotinus coggyria*, *Fontanesia philleoides*, *Daphne sericea*, *Rhamnus oleoides*.

#### LOCALITIES

**Turkey.** Uşak: 25 km from Uşak to Güre, 600 m, Coode, Jones 2788 (Chamberlain, 1970c); Denizli: 5 km N of Civril, 1100 m, Huber-Morath 13455 (Chamberlain, 1970c — subsp. *reeseana*); Denizli: road Aydin-Denizli, sandy hills near Köprübasi, N side of road, 9. 5. 1975, Browicz, Zieliński 101 (KOR.); Denizli: Pamukkale, 7. 5. 1969, Fitz, Spitzenberger 414 (W.); Denizli: 25 km. W Acigöl (Kaklik) 750 m, 7. 6. 1964, Sorger 64-49-12 (Herb. Sorger); Denizli: in collibus denudatis ad ped. mont Baba Dagi prope Denizli, 12. 5. 1931, Guyot (Chamberlain, 1970c — subsp. *reeseana*); Denizli: auf Steppen bei der Mühle Karakurt, 7 km östl. von Denizli, 31. 3. 1935 (Reese, 1940); Denizli to Kocabas Köyü, Yatagan Forest, 21. 5. 1955, Kayacik, Yaltirik (Chamberlain, 1970c); Denizli: Macchie, 7 km südlich von Kale, 1100 m, 5. 6. 1938, Reese, Huber-Morath 5511 (Huber-Morath, 1943 - 1946; 1973 —subsp. *reeseana*); Mugla: Kale-Mugla, 56 km nach Kale, 5. 6. 1938. Reese, Huber-Morath 5512 (Huber-Morath 1943 - 1946; 1973 — subsp. *reeseana*); Denizli: Mugla to Tavas, 960 m, Dudley — Davis 35545 (Chamberlain, 1970c

—subsp. *reeseana*); Mugla: Felschutt 13 km südlich von Mugla, 600 m, 29. 5. 1962, Huber-Morath 16858 (Huber-Morath, 1973 — subsp. *reeseana*); Mugla: d. Marmaris, Yarimadassi towards Emecik, 200 m, 18. 4. 1965, Davis 41319 (E. KOR. — subsp. *reeseana*); Mugla: Sandras Dag, 1900 m, auf Felsen, 10. 6. 1969, Fitz, Spitzenberger 736 (W. — subsp. *reeseana*); Sandras Da., 2000 m, summit, 23. 7. 1947, Davis 13501 (E. KOR. — subsp. *reeseana*); Mugla-Fethiye, 141 km nach Mugla, 7. 6. 1938, Huber-Morath 5514 (Huber-Morath, 1943 - 1946; 1973); Burdur: Fethiye-Dirmil, *Juniperus*-Steppe, 81 km nach Fethiye, 9. 6. 1938, Reese, Huber-Morath 5515 (Huber-Morath 1943 - 1946, 1973 — subsp. *reeseana*); Burdur: 5 km S of Dirmil, 1600 - 1660 m, Huber-Morath rechtes Ufer des Namlam Cay, 7. 6. 1938, Huber-Morath 5513 (Huber-Morath 1943 - 1946 1973 — subsp. *reeseana*); Burdur: 5 km S of Dirmil, 1600 - 1660 m, Huber-Morath 9504 (Chamberlain, 1970c — subsp. *reeseana*); Mugla: Berges in N v Fethiye, Kizilbel Köyüstü, 820 m, 29. 4. 1970, Bozakman, Fitz 372 (W.); Village de Bouloukli, près de Mersina. Terr. calcaire, 25. 4. 1855, Balansa 487 (W.); Namrun, Föhrenwald, ca. 1200 m, 11. 4. 1966, Eiselt (W.); Adana: Tarsus to Ulas, 250 m, 4. 4. 1957, Davis 26359 (E. KOR.); Cilicien, Kagiraki, Kalkige Abhänge, 3. 1895, Siehe (WU.); Adana: 500', 9. 4. 1935, Balls 2098 (Rechinger, 1952a); Adana to Kozan, 250 m, Alpay, Bozakman ANKO 2546 (Chamberlain, 1970c); Seyhan: 3 km SE Kadirli, *Myrtus* Macchie, 100 m, 22. 6. 1971, Sorger 71-29-11 (Herb. Sorger); Adana: 10 - 15 km E of Osmaniye, road to Fevzipasa, loamy slope, oak scrub, 1. 6. 1975, Browicz, Zieliński 225 (Kor.); 14 km E Osmaniye, nach Yarpuz, *Pinus brutia* Wald, 900 m, 24. 6. 1971, Sorger 71-34-55 (Herb. Sorger); Adana: Yaglipinar Dazi ob Yarpuz, 1150 - 1350 m, 2. 7. 1959, Huber-Morath 16163 (Huber-Morath, 1973); Hasan Beyli, 270 m, Balls 758 (Chamberlain, 1970c); In schistosis serpent. supra Alexandrettam, 1500', 18. 2. 1865, Haussknecht (W.); Ex Amano prope Belian. Schistos. versus vinetum Bekschedik incult. 2500', 21. 6. 1862, Kotschy 41 (W.); Nördlich von Belen, Kalkschlucht, 450 m, 15. 6. 1953, Huber-Morath 13444 (Huber-Morath, 1973); Amanus: ad lat. or. transistus supra Belian, in glareosis schist. macchiarum, ca. 600 m, Samuelsson 3976 (Rechinger, 1959); above Baylan (Post, Dinsmore, 1932); Iskanderun: Ulucinar. Fréquent, leux secs et rocailleux sur ophiolite, de 0-600 m (Akman, 1973); Hatay: distr. Belen. Belen-Soguk Oluk, 500 m. Banks in *Pinus brutia* forest, 23. 4. 1957, Davis Hedge 26997 (E. KOR.); Hatay: Soguk Oluk, *Pinus brutia*-Wald, 24. 7. 1966, Akman 3256 (Huber-Morath, 1973); Hatay: d. Samandag, nr Cevelik, 100 m, Coode, Jones 635 (Chamberlain, 1973c); Antioch: Bityas (Post, Dinsmore, 1932).

**Syria.** Kessab (Mouterde, 1970); Cassius: pr. transitum ad Ain el Aramié, in pineto, solo schist.-gneisis. c. 600 m, Samuelsson 5051 (Rechinger, 1959); Ain Haramiyé (Mouterde, 1970); 4 hrs. S. of Kasab (Post, Dinsmore, 1932); in montibus prope Latakia, 1846, Boissier 51 (W.); about 20 km of Latakia, in a road outlet of a dry wadi (Zohary, 1973); Monts Nusairy, Bahamra, 15 mile à l' E. de Ladikie, ca. 1000'. 4. 1909, Haradjian 2920 (W.); Hosn Sleiman, Safita (Post, Dinsmore, 1932; Mouterde, 1970).

**Lebanon.** Alma près Tripoli (Mouterde, 1970); Environs of Btormaz, 700 m, soft whitish chalk (Zohary, 1974); Beit Méri; sous Beit Méri; au-dessus de Choueifat, sous Beit Méri (Mouterde, 1970); Above Choneifat, chalky slopes. 4. 4. 1943, Davis 5484 (E. KOR.); Bei Dschamhur, 250 m, 1.1899, Hartmann (W. WU.); Jamhour, Gombault 1310 (Rechinger, 1959); Grès et marnes à Baabda-Jamhour (Mouterde, 1970); Khan-Jamhur (Post, Dinsmore, 1932).

**Israel.** Haifa, in monte Carmel, solo calc., ca. 100 m, 3. 5. 1897, Bornmüller 476 (W.WU.); Mt. Carmel, W slope above Nesheri, soft chalks, 26. 2. 1947, Zohary, Grizi 743 (W.); Mt. Carmel (Post, Dinsmore, 1932); Sharon Plain (Zohary, 1972); Tabor acc. to Tristram (Post, Dinsmore, 1932).

## SUMMARY

On the basis of herbarium specimens and data from the literature point maps were prepared of the range of 5 species of shrubs from the family Leguminosae, subfamily Papilionoideae in southwestern Asia, northeastern Africa and the Balkan Peninsula (*Anagyris foetida* L., *Calycotome villosa* (Poirot) Link, *Anthyllis hermanniae* L., *Podocytisus caramanicus* Boiss. et Heldr., and *Cytosopsis pseudocytisus* (Boiss.) Fertig. Two of these, *Anagyris foetida* and *Calycotome villosa* are characterized by a strongly elongate range of distribution extending from southwestern Europe (Spain, Portugal) and northwestern Africa (Marocco, Algeria) to the western part of southwestern Asia. The other three species have much smaller ranges restricted primarily to the eastern Mediterranean region.

Each of these species is described in its ecological requirements and in vertical distribution. The elevational maxima in the region in question are attained by *Anagyris foetida* in western Iran, up to 1800 m (in Yemen up to 2800 m), by *Calycotome villosa* in Lebanon up to 1740 m, by *Anthyllis hermanniae* in Turkey up to 400 m, by *Podocytisus caramanicus* in Turkey up to 1000 m and in Greece up to 1600 m, and *Cytosopsis pseudocytisus* in Turkey up to 2000 m. For each species a list of stands in southwestern Asia is presented.

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KAZIMIERZ BROWICZ

## Geograficzne rozmieszczenie niektórych krzewów z rodziny Leguminosae w południowo-zachodniej Azji

Streszczenie

Na podstawie zbiorów zielnikowych oraz danych z literatury autor opracował punktowe mapy zasięgu 5 gatunków krzewów z rodziny *Leguminosae* w południowo-zachodniej Azji, w północno-wschodniej Afryce oraz na Półwyspie Bałkańskim. Gatunki te zaliczane są do śródziemnomorskiego elementu florystycznego. Dwa z nich: *Anagyris foetida* i *Calycotome villosa* charakteryzują się silnie wydłużonym zasięgiem, rozciągającym się od południowo-zachodniej Europy (Hiszpania, Portugalia) i północno-zachodniej Afryki (Maroko, Algieria) po zachodnią część południowo-zachodniej Azji. Pozostałe trzy gatunki mają znacznie mniejsze zasięgi ograniczone głównie do wschodniego Śródziemnomorza.

Na podstawie zebranych informacji autor charakteryzuje zasięgi poszczególnych gatunków. I tak okazuje się, że *Anagyris foetida* występuje w zachodniej i południowej Anatolii (do 1000 m n.p.m.), na Cyprze, w Syrii, Libanie, Izraelu i Jordanii, a także w północnym Iraku (do 1300 m) i w zachodnim Iranie (do 1800 m.) — tu tylko na północnym krańcu masywu górskiego Zagros. Pojedyncze stanowiska *A. foetida* znane są również z półwyspu Synaj oraz z południowo-zachodniej części Półwyspu Arabskiego — z Arabii Saudyjskiej i z Jemenu (do 2800 m). W związku z nieprzyjemnym zapachem liści i trującymi właściwościami krzew ten nie jest zgryzany przez zwierzyne, toteż utrzymuje się nawet na bardzo zdewastowanych terenach w pobliżu osad ludzkich, tam, gdzie już inne krzewy zostały wyniszczone.

Drugi gatunek, *Calycotome villosa*, posiada podobny zasięg, jednak nie dociera tak daleko na wschód i sięga tylko do południowej Turcji, do gór Amanus, gdzie też był znajdowany na wysokości 1120 m n.p.m.; przeważnie występuje na niższych stanowiskach, od wybrzeży morskich po 600-700 m n.p.m. W górach Libanu *C. villosa* rośnie aż na wysokości 1740 m n.p.m. W odróżnieniu do *Anagyris foetida* krzew ten nie jest już reprezentowany na półwyspie Synaj ani na Półwyspie Arabskim, a jego najbardziej południowe stanowisko znajduje się w południowo-zachodniej Jordanii, na Jebel Sarab (30°42' szer. geogr. półn. i 35°35'20'' długo. geogr. wschodn.).

*Anthyllis hermanniae* jest drobnym, ciernistym krzewem dorastającym zaledwie do 50-80 cm wysokości. Centrum jego zasięgu przypada na Wyspy Egejskie i Kretę. Najdalej na zachód sięga on po Sycylię, Sycylię, Korsykę i Baleary, podczas gdy wschodnia granica zasięgu znajduje się w zachodniej Anatolii oraz na wyspie Rodos. Stanowiska *A. hermanniae* są jednak tutaj nieliczne rozmieszczone wzdłuż wybrzeży Morza Egejskiego, mniej więcej po 400 m n.p.m.

Czwarty krzew, *Podocytisus caramanicus*, odznacza się wyjątkowo interesującym zasięgiem, rozdzielonym na dwie zasadnicze części, a dysjunkcja między nimi wynosi około 900 km. Większa część zasięgu obejmuje środkową, jugosłowiańską Macedonię, południową Albanię oraz Grecję (100-1600 m n.p.m.), natomiast druga



— mniejsza część, południową Anatolię — wilajety: Konya, Içel, Adana i Hatay (300-1000 m n.p.m.).

Wreszcie piąty gatunek, *Cytisopsis pseudocytisus*, jest dla południowo-zachodniej Azji endemitem. Jego zasięg składa się także z dwóch części oddalonych od siebie o około 450 km. Jedna z nich przypada na południowo-zachodnią Anatolię (wilajety: Mugla, Denizli, Uşak), a druga — na północy Izrael, zachodnią Syrię, Liban oraz wilajety: Içel, Adana i Hatay w południowej Anatolii. W pierwszym regionie występują dwa podgatunki: *C. pseudocytisus* subsp. *pseudocytisus* i subsp. *reeseana*, a w drugim — tylko podgatunek typowy, który w swym pionowym rozmieszczeniu dochodzi do 1350 m n.p.m. Subsp. *reeseana*, charakteryzująca się prawie dwukrotnie mniejszymi kwiatami od subsp. *pseudocytisus* znajduje się znacznie wyżej, bo aż do 2000 m n.p.m. (Sandras Dag).

КАЗИМЕЖ БРОВИЧ

### Географическое размещение некоторых кустарников из семейства *Leguminosae* в юго-западной Азии

Резюме

На основании анализа гербарных материалов и литературных источников автор разработал точечные карты размещения 5 видов кустарников из семейства *Leguminosae* в юго-западной Азии, северо-восточной Африке и на Балканском полуострове. Эти виды причисляются к средиземноморским флористическим элементам. Два из них: *Anagyris foetida* и *Calycotome villosa* характеризуются сильно растянутым ареалом протягивающимся от юго-западной Европы (Испания, Португалия) и северо-западной Африки (Марокко, Алжир), до западной части юго-западной Азии. Остальные три вида имеют значительно меньший ареал, ограничивающийся, главным образом, восточным Средиземноморьем.

На основании собранных материалов автор характеризует ареалы распространения указанных видов. И так оказалось, что *Anagyris foetida* встречается в западной и южной Анатолии (до 1000 м над ур.м.), на Кипре, в Сирии, Ливане, Израиле и Иордании, а также в северном Ираке (до 1300 м) и в западном Иране (до 1800 м) в северной части горного массива Загрос. Единичные местонахождения *A. foetida* известны также на Синайском полуострове и в юго-западной части Аравийского полуострова — в Саудовской Аравии и Йемене (до 2800 м). Из-за неприятного запаха листьев и ядовитых свойств этот кустарник не поедается животными, в связи с чем он удерживается даже на очень сильно деградированных землях вблизи поселений, в местах, где другие кустарники уничтожены.

Второй вид, *Calycotome villosa*, имеет схожий ареал однако он не протягивается так далеко на восток и достигает лишь южной Турции, до гор Аманус, где его находили на высоте 1120 м над ур.м.; в большинстве случаев он растет на более низких местообитаниях, от берегов морей до высоты 600 - 700 м над ур.м. Однако в горных массивах Ливана встречается даже на высоте 1740 м над ур.м. В отличие от *Anagyris foetida* этот кустарник не встречается на Сипайском и Аравийском полуостровах, а его самое южное местообитание находится в юго-западной Иордании, на Жебель Сараб (30°42' северной широты и 35°35'20" восточной географической долготы).

*Anthyllis hermanniae* — это небольшой, колючий кустарник, достигающий лишь 50 см высоты. Центр его ареала приходится на Эгейские острова и остров Крит. На западе он распространен до Сицилии, Сардинии, Корсики и Балеар, в то время как западная граница его распространения находится в западной Антолии и на острове

Родос. Однако, местонахождения *A. hermanniae* здесь немногочисленны. Они размещаются вдоль побережья Эгейского моря, примерно до 400 м над ур. м.

Четвертый кустарник, *Podocytisus caramanicus* характеризуется исключительно интересным ареалом разделенным на две основные части с дизъюнкцией, равной около 900 км. Большая часть ареала находится в средней, югославской части Македонии, южной Албании и Греции (100 - 1600 м над ур.м.), а вторая, меньшая, часть в южной Анатолии — вилаеты: Конья, Ичел, Адана и Гатай (300 - 1000 м над ур. м.).

Пятый вид: *Cytisopsis pseudocytisus* является для юго-западной Азии эндемическим видом. Ареал его распространения также состоит из двух частей отдаленных друг от друга на расстояние ок. 450 км. Одна из них приходится на юго-западную Анатолию (вилаеты Мугла, Дензили, Ушак), а вторая на северный Израиль, западную Сирию, Ливан и вилаеты Ичел, Адана и Гатай в южной Анатолии. В первом районе встречаются два подвида: *C. pseudocytisus* subsp. *pseudocytisus* и subsp. *reeseana*, а во втором — лишь типичный подвид, который в своем вертикальном размещении достигает высоты 1350 м над ур.м. Subsp. *reeseana*, характеризующаяся почти вдвое меньшими цветами чем subsp. *pseudocytisus*; встречается значительно выше — до 2000 м над ур.м. (Сандрас Дар).