

ARISTOLOCHIA IN THE NEAR EAST

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INTRODUCTION

Very little attention has been paid to the taxonomy of *Aristolochia* of the Near East. The main sources are Duchartre's monograph of the family (in DC., Prodr., xv, (1): 421-498 (1864)), Boissier's account in his *Flora Orientalis* (iv: 1074-1082 (1879)), and Sosnowsky's revision of the Georgian species (Not. Syst. Geogr. Inst. Bot. Tphilis., Acad. Sc. U.R.S.S.—Sect. Georg., Fasc. 6:11 (1939)). A phyletic rearrangement of the *Aristolochiaceae* has been proposed by M. C. Gregory (Amer. Journ. Bot., xliii: 110 (1956)), and a claim, on teratological evidence, that the perianth of *Aristolochia* may be homologous with a vegetative leaf, has been put forward by J. W. Lorch (Evol. xiii, 3: 415 (1959)).

The present study is confined to the species from Greece (including the Aegean islands), Crimea, Turkey, Caucasus, Iran, Iraq, Syria, Lebanon, Palestine and Cyprus.

All the European and Mediterranean *Aristolochias* are placed by Schmidt (Nat. Pflanzenf. xvi: 240 (1935)) in Subsect. *Euaristolochia* Klotzsch (i.e., Subsect. *Aristolochia*, which includes the type of the genus, *A. rotunda* L.). The most closely allied group is apparently Subsect. *Podanthemum* Klotzsch which is widely distributed in the Tropics and Subtropics of the Old World. All the European and Mediterranean species, with the exception of two lignified evergreen climbers (*A. semper-virens* L. and *A. baetica* L.) are erect or diffuse herbaceous perennials, often with a tuberous root. The temperate Subsect. *Aristolochia* has presumably been evolved from an ancestral tropical (or subtropical) stock and represents, historically speaking, an ancient tropical element in the Mediterranean flora which has evolved its modern characteristics in relation to the establishment of the Mediterranean climate during the latter half of the Tertiary.

PHYTOGEOGRAPHICAL DISTRIBUTION

Subsect. *Aristolochia* has its centre of distribution in the Near East where by far the largest number of species (18) occurs in Anatolia. Most of the species are mesophytic and very local. In Anatolia only the xerophytic *A. maurorum* L. can be described as a common, probably invasive species. The accompanying table summarises the phytogeographical distribution of the Near East species almost throughout their whole range; parenthesis indicate that the species extends only exceptionally into that region. It will be seen that the maximum concentration of species is in the Mediterranean region (*sensu stricto*); indeed 22 out of the 25 species occur there, and 13 are confined to it. These include a wide range of morphological types, whereas most of the species growing in the other

three areas (Central European, Hyrcano-Colchic and Irano-Turanian) are closely allied to other species within those areas and the Mediterranean. This suggests that the main diversification of the subsection has taken place within the Mediterranean region, and probably in its eastern part.

Distributional maps for some closely allied species are given in the text. These are based (except for some type localities) on material examined.

Table showing the distribution of the Near East species of *Aristolochia* according to phytogeographical regions:

<i>Species</i>	*Central European	*Hyrcano- Colchic	Mediterranean	Irano- Turanian
1. <i>sempervirens</i>	—	—	+	—
2. <i>iberica</i>	—	+	—	—
3. <i>billardieri</i>	—	—	+	—
4. <i>brevilabris</i>	—	—	+	—
5. <i>steupii</i>	—	+	—	—
6. <i>hyrcana</i>	—	+	—	—
7. <i>pontica</i>	—	+	(+)	—
8. <i>cretica</i>	—	—	+	—
9. <i>bodamae</i>	—	+	+	—
10. <i>hirta</i>	—	—	+	—
11. <i>auricularia</i>	—	—	+	+
12. <i>paecilantha</i>	—	—	+	(+)
13. <i>bottae</i>	—	—	(+)	+
14. <i>olivieri</i>	—	—	+	—
15. <i>maurorum</i>	—	—	(+)	+
16. <i>cillica</i>	—	—	+	—
17. <i>lycica</i>	—	—	+	—
18. <i>stenosiphon</i>	—	—	+	—
19. <i>incisa</i>	—	—	+	—
20. <i>clematitis</i>	+	+	+	(+)
21. <i>rotunda</i>	+	—	+	—
22. <i>pallida</i>	+	+	+	—
23. <i>longa</i>	—	—	+	—
24. <i>parvifolia</i>	—	—	+	—
25. <i>microstoma</i>	—	—	+	—

* The Central European and Hyrcano-Colchic areas should probably be treated as provinces of the Euro-Siberian region, co-ordinate with the Mediterranean and Irano-Turanian regions, as will be elaborated in a later paper. P.H.D.

SPECIFIC CRITERIA AND VARIATION

Root: the shape of the main (primary?) root—globose, ovoid, elongated and cylindrical, fusiform or napiform—is a constant character of great importance in the delimitation of species. Two species have slender roots that arise from a rhizome (*A. pistolochia* L. and *A. clematitis* L.).

Leaf: there are three basic types of leaf shape:- (1) cordate-ovate with rounded sides, (2) cordate-deltoid with straight sides, and (3) lanceolate or linear-lanceolate with a biauriculate base. Within these three limits there are minor variations which constitute important diagnostic characters in most of the species. Length of the petiole, size and shape of the auricles, and their posture (straight, diverging, incurved, or horizontal), leaf margin (entire, crenate, sinuate, undulate or cartilaginous-denticulate)

and leaf indumentum can provide useful characters for species separation. However, some of these, notably petiole length, cartilaginous-denticulate condition of leaf margin and indumentum may be directly controlled by habitat and often show variation within a single species. Another variable character which has been overestimated as a specific criterion by previous workers, is the leaf apex; it may vary from acute to obtuse or emarginate even in the same species (e.g. *A. cretica*). Leaf size varies within rather wide limits (e.g. *A. maurorum* L.).

Perianth: within species of *Aristolochia* the size of the perianth varies within exceptionally wide limits. The following perianth characters are diagnostic: utricle—its shape and size (gross and in relation to tube); tube—straight or curved, diameter at the base, whether expanded above or not, glabrous or hairy (inside and outside), and its length relative to utricle and limb; limb—size, shape, auriculate or exauriculate at the base, length relative to the tube, hairy or glabrous inside, and in some cases the breadth of the lower rim of the limb (as in *A. billardieri* and *A. iberica*). Differences in the shape of the perianth limb (e.g. presence or absence of auricles) often separate closely allied species. Perianth colour would no doubt provide a valuable specific character if it were better recorded (see below), but unless good field notes are taken it is difficult to ascertain correctly from dried material.

The relative length of peduncle and petiole, shape and indumentum of ovary, and size, shape, and indumentum of capsule should also provide, in some cases, characters for the separation of allied species.

MEASUREMENTS OF THE PERIANTH

From the figures given by Boissier and others in the case of perianths with U-curved tubes, it appears that the length has usually been measured in a straight line from the base of the utricle to the farther side of the bend of the tube, and the width from the tip of the limb to the outer side of the tube near the utricle. In the present work, however, separate measurements of utricle and limb have been taken. Where the overall length of the perianth with U-curved tube has been given, the measurement has invariably been taken by running a thread round the perianth from the base of the utricle to the tip of the limb. In some critical cases the perianth had to be dissected and the limb spread out to examine the outline, the presence of auricles, and the indumentum on the inside.

SOME SUGGESTIONS REGARDING COLLECTING

As the rootstock provides a very important taxonomic character, a strong need is felt for invariably collecting at least part of it with each gathering. The examining of perianth characters in detail in the herbarium would be very greatly eased if the perianth limb were cut off from the tube and pressed flat separately to show its general outline and measurements, and indumentum and/or colour patterns of the throat. The rest of the perianth may be split longitudinally into two halves which are then pressed separately so as to show the indumentum of the tube from both sides. Notes on perianth colour should include the shades on the outside of the

tube and inside of the limb separately, and the striations or details of mottlings on the inner side of the limb and in the throat.

The leopard-like mottling on the perianth limb of many species is probably an adaptation to pollination by carrion flies. The diversity of floral structure and colouring, however, suggests that more than one method of pollination is involved. Field observations are needed.

KEY TO THE NEAR EAST SPECIES

1. Flowers 2-8 together in the axils of leaves; plant with a creeping rhizome 20. *clematitis*
1. Flowers solitary in the axils; plants without a creeping rhizome:
 2. Perianth without a conspicuous unilateral limb, the apex clavate, opening by a small lateral pore 25. *microstoma*
 2. Perianth with a conspicuous unilateral limb:
 3. Stems usually climbing, lignified; leaves evergreen, coriaceous. Perianth yellow with purple striations or brownish purple outside 1. *sempervirens*
 3. Stems not climbing, herbaceous; leaves herbaceous:
 4. Perianth tube \pm straight:
 5. Perianth limb with 2 short round auricles, ovate-rotund, dark purplish brown inside with copious white hairs in the throat; leaves broadly deltoid, leaf margin with cartilaginous teeth or papillae. Plants dwarf (5-10 cm.) with branched stems 11. *auricularia*
 5. Perianth limb exauriculate, manifestly longer than broad; leaves not deltoid; leaf margin entire or sinuate:
 6. Fully developed leaves c. 2.5 cm. long, ovate-oblong with cordate to subquadrate base; stems filiform, prostrate or ascending; perianth limb at least twice as long as tube 24. *parvifolia*
 6. Fully developed leaves more than 3 cm. long or broad, cordate-ovate; stems erect; perianth limb as long as or shorter than tube:
 7. Leaves subsessile, petioles not more than 4 mm. long; leaf auricles embracing the stem (sinus narrow). Perianth yellow outside, limb dark brown outside with purple striations inside 21. *rotunda*
 7. Leaves with distinct petioles more than 5 mm. long; leaf auricles not embracing the stem (sinus broad):
 8. Root cylindrical or fusiform; perianth greenish-brown outside 23. *longa*
 8. Root globose; perianth yellowish-green outside 22. *pallida*
 4. Perianth tube strongly U-curved:
 9. Perianth limb distinctly biauriculate at the base:
 10. Leaf blade about as long as broad:

11. Leaves cordate-ovate or cordate-orbicular (with rounded sides), with straight or incurved auricles:
 12. Leaves smaller than the flower (lamina 2.5-5.5 cm. \times 2-6 cm.), hirtellous; base of perianth limb shortly biauriculate 8. *cretica*
 12. Leaves larger than the flower (lamina 6-16 cm. \times 4.5-12.5 cm.), glabrescent; base of perianth limb deeply biauriculate 7. *pontica*
11. Leaves deltoid (with more or less straight sides), with diverging auricles:
 13. Perianth limb much smaller than the tube, base obsoletely bilobed or emarginate 14. *olivieri*
 13. Perianth limb as long as or longer than the tube, base deeply cut into 2 round or oblong auricles:
 14. Perianth limb 13-15 mm. broad, acute; plants dwarfish (15-20 cm.) 18. *stenosiphon*
 14. Perianth limb up to 4 cm. broad, obtuse or acute; plants taller (up to 55 cm.) 12. *paecilantha*
10. Leaf blade much longer than broad:
 15. Leaves with petioles more than 1 cm. long:
 16. Perianth limb oblong-ovate with cordate base; perianth greenish-yellow outside, limb with dark purple spots inside 12. *paecilantha*
 16. Perianth limb cordate-ovate; perianth blackish green outside, limb dark purple with paler spots at the tip 9. *bodamae*
 15. Leaves with short petioles, not more than 1 cm. long:
 17. Stems simple:
 18. Leaves subdeltoid with rounded incurved auricles 9. *bodamae*
 18. Leaves lanceolate or linear-lanceolate with auricles narrow, spatulate, much longer than broad, widely divaricate:
 19. Perianth tube slender, 1-3 mm. in diameter at the base; utricle small (5-9 mm. \times 3-7 mm.); limb ovate-oblong, apex obtuse 17. *lycica*
 19. Perianth tube wide, 2-10 mm. in diameter at the base; utricle large (5-15 mm. \times 4-15 mm.); limb broadly ovate, apex abruptly acuminate 15. *maurorum*
 17. Stems branched; leaves lanceolate with elongated divergent auricles 13. *bottae*
9. Perianth limb without auricles at the base (though rarely emarginate):
 20. Perianth limb very short, reduced to a reflexed mucro; perianth violet brown outside 4. *brevilabris*
 20. Perianth limb larger, not reduced to a mucro:
 21. Perianth tube glabrous outside or sparsely hirtellous on veins only:
 22. Perianth limb about 2 times longer than tube; leaf lamina c. 3 cm. \times 2 cm., cordate-ovate, auricles small, as long as broad 19. *incisa*
 22. Perianth limb as long as or shorter than tube:

23. Leaf lamina widely deltoid to ovate-deltoid (2.5-6 cm. \times 1.5-9 cm.), with auricles twice as long as broad, round and incurved at the tip; perianth limb ovate-oblong (10-25 mm. \times 5-17 mm.), acute or obtuse, obsoletely bilobed or emarginate at the base, with rim 2-3 mm. broad 14. *olivieri*
23. Leaf lamina oblong-lanceolate (5-12.5 cm. \times 2.5-5 cm.), with auricles as long as broad, rounded, scarcely incurved at the tip; perianth limb broadly ovate (15-35 mm. \times 15-35 mm.), acuminate, lower rim up to 10 mm. broad 16. *cilicica*
21. Perianth tube hirsute, pubescent or papillose outside:
 24. Perianth tube 2-8 (-11) mm. broad in its narrowest part, limb hirsute within; leaves ovate-deltoid, up to twice as long as broad with straight sides. Root fusiform-cylindrical 10. *hirta*
 24. Perianth tube 1.5-3 mm. broad in its narrowest part, limb glabrous within; leaves cordate-ovate, as broad as long with rounded sides:
 25. Root a globose tuber:
 26. Perianth limb brownish-purple, lower rim (2-)4-5 mm. wide, throat yellow and scattered with black hairs 5. *steupii*
 26. Perianth limb yellowish-green, lower rim 1.5-1.75 mm. broad, striped with 5 purplish-black lines and with the throat glabrous 6. *hyrcana*
 25. Root oblong or cylindrical:
 27. Perianth limb with the lower rim 1.5-3 mm. broad; leaves 2-9 cm. long 3. *billardieri*
 27. Perianth limb with the lower rim 5-10 mm. broad; leaves 6-14 cm. long 2. *iberica*

ENUMERATION OF SPECIES

In the following account all the species are arranged in as natural an order as a linear sequence allows. Unless otherwise indicated, all specimens cited (including types) have been examined. An exclamation mark after a synonym means that type material of it has been seen.

1. *A. sempervirens* Linn., Sp. Pl., ii, 961 (1753). Boiss., Fl. Or. iv, 1075 (1879); Sibthorp & Sm., Fl. Graeca, x, t. 934 (1840); Bot. Mag. t. 1116 (1808) and t. 6586 (1881).

Syn.: *A. altissima* Desf., Fl. Atlant. ii, 324, t. 249 (1799).

Root cylindrical, much branched at the top. Stems branched, subscandent or scandent, suffruticose below, 20 cm. to more than a metre long. Leaf lamina ovate to ovate-lanceolate, evergreen, 2-10 cm. long and 1.5 to 5 cm. broad, acute or obtuse, sub-coriaceous, glabrous, base deeply cordate with short round auricles; petiole 3-30 mm. long. Flowers solitary, axillary. Peduncles 1-4 cm. long. Perianth U-curved 2-4.5 cm. long, outside brownish purple, or yellow with purple striations, glabrous; utricle ovate to globose (3-7 mm. \times 2-8 mm.); tube 1-3 mm. broad at the base, gradually dilated towards the top up to 3-11 mm.; limb ovate to ovate-oblong, 8-20 mm. long and 8-15 mm. broad, acute or obtuse, often hairy

at the throat. *Ovary* clavate, pubescent. *Capsule* oblong to spherical. Fl. Febr.-May. On brambles and bushes near streams, dry hillsides and chalky soils up to 1350 m.

Type: in Creta (Herb. Cliff.).

GREECE. Peloponnesus: Achia, c. 500 m., 6 Nov. 1926, *Bornmüller* 1376; Mt. Chelmos, a. 1930, *F. Guiol*; in Monte Malevo Laconia prope Platanos, 900 m. 18/30 June 1850, *Orphanides* 129; Laconia, a. 1930, *Guiol*. Ionian Is.: Ithaca, pr. Vathy, 1 May 1934, Herb. *F. Guiol* 2380.

CRETE: Dist. Kissamos, Reumati, 24 June 1893, *Baldacci* 41. Dist. Mirabello, Georgios et Psychro (Omalo Lassithi), 1 July 1899, *Baldacci* 191; Psychro and Aphendi Christo, 19/20 June 1937, *Lempberg* 512; Lassithi plain, 20 May 1914, *Gandoger* 2592; *ibid.*, 900 m., north slopes, 1 June 1937, *Davis* 14. Omalo, 900 m., 10 June 1938, *M. Ogilvie Grant* 24. Intra Kavusi et Sitia, 300 m., Sept. 1938, *Davis and R. Barneby*. Cicaleria in Creta, 5 May 1814, *Sieber* (Herb. *Spruner*).

TURKEY. Prov. Çanakkale: Mt. Ida in marmor prope Kareikos, 25 July 1883, *P. Sintenis* 588 [Sterile, erect habit—perhaps due to grazing].

SYRIA. Montes inter Aleppo and Belen, 1754, *Russell*. Tripoli: Firhet el Ghuraba, 25 April 1865, *Post*. Beirut: near St. Georges Chapel, May 1857, leg. (?); *ibid.*, March 1871, ex Herb. *Post*. Baniyas, 1863-4, *B. T. Lowne*.

LEBANON. Wadi south of Tripoli in suburb, 45 m., 7 May 1945, *Norris*.

PALESTINE. In territorio montis "Hermon", Rascheya, 1350 m., 24 Jan. 1855, *Th. Kotschy* 156.

CYPRUS. Perapedi, 780 m., 18 Nov. 1937, *E. W. Kennedy* 311, 312. Below Phterykha, 150 m., 20 Apr. 1956, *M. E. D. Poore* (*L. F. H. Merton* 2691). Dist. Limassol: below Madhari, 14 May 1941, *P. H. Davis* 3428; Limassol Road, first bridge after Chirokitia, *A. G. and M. E. Lascelles*. Adelphi forest, c. 510 m., 3 May 1957, *L. F. H. Merton* 3138. Orga, 23 Febr. 1957, *L. F. H. Merton* 2853. Kyrenia, s.w. maquis, 330 m., 1 May 1949, *E. C. Casey* 650; *ibid.*, Mylory forest station, 300 m., 22 March 1937, *A. Syngrossides* 1465. Below Neokhorio, 6 Apr. 1957, *Merton* 3059. Platres, 1035 m., 2 May 1937, *Kennedy* 308. Mandria, 780 m., 7 May 1937, *Kennedy* 309. Kato Lefkara, 600 m., 7 Apr. 1937, *Syngrossides* 1526. Stavros river, Paphos forest, 690 m., 2 May 1934, *G. W. Chapman* 140. In monast. Kikku, 5 July 1880, *Sintenis* 698. Infra monast. Trooditissa, 17 Mai 1862, *Kotschy* 736.

A. sempervirens was described from Crete and *A. altissima* from Algeria. It is claimed by Boissier (Fl. Or.) that the latter differs in its taller, thicker stems woodier below, larger leaves, and perianth with proportionally shorter limb than tube. Material from Crete and Cyprus shows that every transition exists between these two taxa, and notes on flower colour on typical Cretan specimens of *A. sempervirens* and Cyprus material of *A. altissima* are the same (purplish brown outside with the lip yellow within). From this one is bound to conclude that *A. sempervirens* represents a depauperate state (or ecotype?) of *A. altissima* in the drier more exposed habitats that are so frequent on Crete. Unless cultivation should show that the small variant is genetically distinct from *A. altissima*, there seems no justification for assigning varietal or subspecific rank to it. *A. sempervirens* must be adopted as the earlier name for the species.

The species occurs in Algeria, Sicily, Greece, Albania, Lebanon, Cyprus, Crete and N.W. Anatolia. It is closely allied to *A. baetica* L. (*A. glauca* Desf.) from Spain, Morocco and Algeria which differs in its relatively broader glaucescent leaves and very glabrous ovary.

As *A. sempervirens* was first described by Linnaeus in his *Hortus Cliffortianus*, it should be typified by the specimen in Clifford's Herbarium. The specimen bearing this name in the Linnean Herbarium is a large-flowered form of *A. baetica* L.

2. *A. iberica* Fisch. & Mey. ex Boiss., Fl. Or. iv, 1081 (1879). Sosnowsky, Not. Syst. Geogr. Inst. Bot. Tphilis., Acad. Sc. URSS, Sect. Georg. fasc. 6: 11 (1939), descr. emend., and p. 8, f. 2; Grossheim, Fl. Kavkaza, ed. 2, iii, 82 (1945).

Syn.: *A. pontica* Lam. var. *parvifolia* Duch. in DC., Prodr. xv (1), 493 (1864).

Root stoutly cylindrical, shortly branched. *Stems* simple, erect, flexuose, 25–45 cm. tall. *Leaf lamina* 6–14 cm. long, 6–12 cm. broad, broadly cordate-ovate with rounded sides, glabrous or sparsely puberulous above, paler and more or less hirtellous below, apex subacute or rarely rounded, base with wide sinus and round obtuse auricles; petiole 2–5 (–7) cm. long. *Flowers* solitary, axillary. Peduncles shorter than petioles. *Perianth* 3.7–7.5 cm. long, (in sicco) greenish, greyish brown or dull maroon outside; utricle oval-oblong, 5–10 mm. \times 4–8 mm.; tube U-curved, 2–3 mm. broad at the base, scarcely expanded towards the top, hirtellous outside; limb ovate or ovate-oblong (1.5) 2.5–4 cm. long, acute or somewhat obtuse, lower rim rounded or emarginate (scarcely auriculate), (3–)5–10 mm. broad, inside glabrescent with short whitish hairs at throat, often yellowish green with brownish purplish mottling that coalesces to give a dark purplish brown throat (rim sometimes purplish brown and throat paler). *Ovary* obovate, pubescent. *Capsule* broadly oblong, c. 2.2 cm. long, pubescent. Fl. April–June.

In thickets and on damp banks in sheltered gulleys and in deciduous forests, up to 500 m.

Lectotype: Caucasus: in fruticetis ad Malitzki [Molite] Cartalineae, Szowits (LE, G, K).

CAUCASUS. Abchasia, prope Suchum, 22 Apr. 1927, *Gubbis* (Grossheim & Schischkin, Pl. Or. Exs. 1928, no. 382). Prov. Kutais, dist. Suchum, pr. m. Apjancza, 7 May 1902, *Alexeenko* 3321 (LE). Inter Kutais et Suram, *Wittmann* (LE). Suchum, in silvis pr. Merchnel, 7 Mai. 1902, *Alexeenko* 3322 (LE). Abchasia, in sylvis c. Juzjevskoje in Tzebelda, 350–450 m., 17 Mai. 1905, *Woronow* (LE). Abchasia, Poyrtskha, 12 Apr. 1902, *Woronow* (LE). Near Gagri, at Garinshi on road to Abies Forest, Aug. 1929, *Sakarov* (LE). Nachetia, prope Lagodechy, 7 Mar. 1901, *Mlokosiewicz* (LE). Azerbaidjan: Zakatali distr., S. slope of Mt. Eresirt, 17 June 1946, *Ilinskaya* & *Kirpichnikov* (LE). Armenia, *Szowits* (LE). Georgia: circa coenobium Shua-mta prope Telav/Kachetia, 9 Jun 1918, *Pastuchov* 459.—Endemic to the Caucasus and N.E. Turkey.

TURKEY. Prov. Rize: Cinciva (S.E. of Rize), 450 m., 24 Apr. 1959, *Guichard* T/80/59. Prov. Artvin, forest near Kwarurana, 7 Mai 1903, *Woronow* 1569 (LE).

In his revision of the Georgian *Aristolochias*, Sosnowsky describes four varieties of *A. iberica* (var. *picta*, *viridescens*, *simia* and *irrorata*), distinguished primarily on perianth colour; specimens, however, are only cited under the binomial, and it is not known whether these variants represent populations or not. A rather wide range of perianth patterns occurs in some other species (e.g. *A. bottae* and *A. paecilantha*).

Sosnowsky described *A. iberica* as having a globose tuber. This is not borne out by the Leningrad material nor by living plants collected by Mrs. Artushenko in the Caucasus in 1960. It does, in fact, have a thickly cylindrical, shortly branched root as in *A. pontica* which Sosnowsky also erroneously described as having a globose tuber. This feature helps to separate it clearly from the West Caucasian *A. steupii* which we thought, until the Leningrad material was examined, might not be specifically distinct from *A. iberica*. *A. iberica* is, in fact, very closely allied to *A. billardieri* of which we have seen very little material (for differences, see observations under that species). Out of flower, *A. iberica* can be readily mistaken for *A. pontica* whose range it partially overlaps, although in *A. iberica* the hairs on the lower leaf surface are usually longer. The species is exceptionally variable in the size of its leaves and flowers—probably due to environmental differences.

3. *A. billardieri* Jaub. et Spach, Illustr. Pl. Or. i, 175, t. 100 (1844); Boiss., Fl. Or. iv, 1077 (1879); Zohary in Palest. Journ. Bot., Jerus. Ser. ii, (2/3), 183 (1941); Post. Fl. Syria, Palestine and Sinai, ii, 490, f. 618 (1933).

Root oblong to cylindrical. Stems simple or branched, 15–50 cm. tall, pubescent. Leaf lamina cordate-ovate, 2–9 cm. long and 2–7 cm. broad, shortly hirtellous or pubescent, paler beneath, acute, obtuse or retuse; Petiole 5–45 mm. long. Peduncles shorter than petioles. Perianth 25–60 mm. long, purplish brown and hirsute outside; utricle 7 mm. \times 3–7 mm.; tube U-curved, 1–4 mm. broad at the base; limb oblong-lingulate to broadly ovate-oblong of variable length (7–25 mm.), acute or obtuse, 5–10 mm. broad at the broadest part, lower rim 2–3 mm. broad, green and glabrescent within with purplish spots above hairy throat (D. 26815; 5-lined in Jaubert & Spach's fig.). Ovary densely spreading-hirtellous. Capsule pyriform. Fl. April.

In stony places in woods, up to 1350 m.

Type: in Syria [Lebanon], Labillardière (Herb. Webb, Florence, n.v.).

TURKEY. Cilicia: Kalkberge zw. Eichen, Apr. 1896, W. Siehe 135. Prov. Adana, dist. Bahçe (N. Amanus), Haruniye—Fevzipaşa, 700 m., 18 Apr. 1957, Davis & Hedge (D. 26815).

SYRIA SEPT. 1888, Sintenis 51. Ain el Beitha, inter Alexandrette et Aleppo, Feb. 1865, Haussknecht.

LEBANON. Nebi Shuah, 1200–1350 m., 14 June 1943, Davis 6340A.

PALESTINE. Wadi Qurran at Rasel Nabi, 28 May 1942, Davis 4831.—Endemic to the countries cited above.

The length of the petioles and the size and shape of the perianth limb is very variable, on the basis of which Zohary recognises four varieties:—(1) var. *billardieri* from 'Syria' (with short petioles and oblong-lingulate limb, 12 mm. long), (2) var. *brevilabris* (Bornm.) Zohary (*A. brevilabris* Bornm.) from the Amanus in south Turkey (limb a small beak-like

backwardly bent appendage), (3) var. *haussknechtii* Beauv. from between Aleppo and Alexandrette (short petioles, perianth limb sub-rotund), and (4) var. *galilea* Zohary from Northern Palestine (longer petioles '2-4 cm.' and oblong-triangular limb shorter than tube.) We have not seen enough material of this very local species to assess the value of these varieties. Davis 26815 from the North Amanus has a lingulate limb up to 25 mm. long. We have provisionally maintained *A. brevilabris* as a separate species, although it occurs in the same area as *A. billardieri*.

A. billardieri is closely related to *A. iberica* Fisch. et Mey. (which sometimes has an exauriculate limb) but differs in the narrower lower rim of the limb (2-3 mm.—in *A. iberica* 5-10 mm.) and usually smaller leaves.

4. *A. brevilabris* Bornm. in Notizbl. Bot. Gart. Berlin, vii, 37 (1917). K. H. Rechinger in Arkiv för Botanik, Ser. 2, v (1), 102 (1959).

Syn.: *A. billardieri* Jaub. & Spach var. *brevilabris* (Bornm.) Zohary in Pal. Journ Bot., J. Ser. ii (2/3), 183 (1941).

Stems erect or ascending, slender, flexuose, simple, rarely branched at the base, glabrous. *Leaf lamina* maximum 4 cm. long and 3 cm. broad (upper leaves longer and broader by 2.5 and 1.5 cm.), herbaceous, under the lens papillate-bristly, ovate, obtuse, sinus narrow, base reniform-cordate, apex somewhat emarginate and mucronulate, margin obsoletely denticulate or entire; petiole 2-2.5 cm. long. *Flowers* axillary, small. *Peduncles* filiform, 5-7 mm. long, pilose. *Perianth* U-curved, violet-brown outside; tube 7 mm. in diameter, gradually dilated upwards; limb narrow, exauriculate, reduced to a short reflexed mucro. *Ovary* hispid. *Type*: Turkey, Alexandrette ("Harunje-Alexandrette"), 200-400 m., Meincke 263, p.p. (B, destroyed—sketch of type seen).

TURKEY. Amanus: in dit. Harounie, 200 m., Haradjian 3575 (fide Rechinger fil., n.v.).—*Endemic*.

A. brevilabris (of which we have seen no material) apparently differs from *A. billardieri* only in its very reduced perianth limb. We follow Rechinger in maintaining it at specific rank. Davis's gathering of *A. billardieri* from the N. Amanus (D. 26815) has an exceptionally long perianth limb and therefore does not approach *A. brevilabris*.

This species is also closely allied to *A. iberica* Boiss.

5. *A. steupii* Woronov in Grossheim, Fl. Kavkaza, ii, 31 (1930), *rossice*. Woronov in Acta Inst. Bot. Ac. Sc. URSS, Ser. 1, i, 214 (1933), *latine*; Fl. URSS, v, t. 25 f. 1 (1936)).

Root tuber orbicular, c. 2.5 cm. diam. *Stems* 10-35 cm. tall. *Leaves* orbicular, deeply inflexed-cordate, 4-13 cm. long, usually as broad as long, apex rounded or emarginate, hirtellous below. *Perianth* up to 5 cm. long; utricle suborbicular-oblong, 5-7 mm. wide; tube U-curved, greyish brown outside, hirtellous, 2 mm. broad at base, gradually enlarged above, limb 1.5-3 cm. long, ovate, usually obtuse, the lower rim (2-) 4-5 mm. wide, emarginate or subentire at the base, brownish purple, pubescent, throat bright yellow, scattered all over with blackish hairs with swollen bases. *Fruit* (immature) pyriform to broadly oblong, pubescent. Fl. March-April. In deciduous forest.

Type. Caucasus: e viciniis Socri Circassiae, W. Steup a. 1918 (LE).

CAUCASUS. Gagri: Joviaku ridge, in the forest, 6 March 1913, *Sakarov* 755 (LE). Environs of Tuapse, 2 May 1948, *T. Lugovaya* (LE). Culta in Hort. Tiflis. e tuber. a cl. Steup a 1923 e Circassia prope p. Soloch-aul austr. Socri lectis (Herb. Woron. a. 1924, LE)—basis of Woronov's emended Latin description).

A very attractive species readily distinguished from *A. iberica*, which replaces it to the east, by its orbicular root tuber, always rounded leaves, strikingly bicoloured flowers (the golden yellow throat being surrounded by a dark brownish purple limb) with a pubescent limb and blackish tuberosus-based hairs in the throat. In the form of its root and leaves it resembles *A. hyrcana*.

6. *A. hyrcana* Davis & M. S. Khan, spec. nov.

Affinis *A. billardieri* Jaub. & Spach et *A. steupii* Woron.; a priori tubere globoso, fauce perianthii glabra recedit; ab altera perigonio minore coloris valde diversi labro inferiore angustissimo fauce glabro differt.

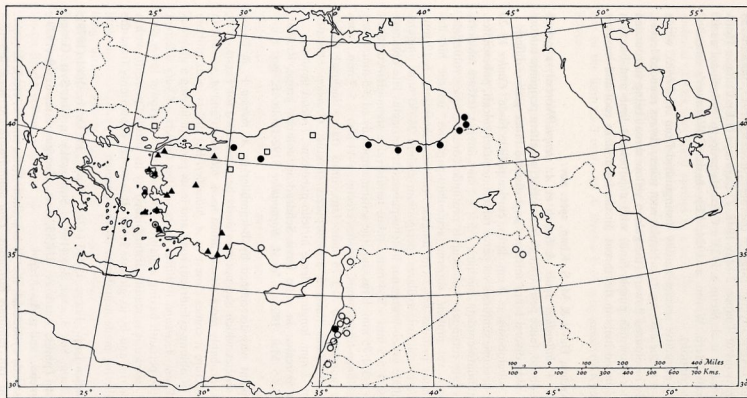
Tuber subglobosus, c. 3 cm. latus, cortice pallide fusco. *Caules* 13–20 cm. alti, flexuosi, simplices vel parce ramosi, tenuiter sulcati, pubescentes. *Folia* rotundato-cordata, mediana 4–5 × 3–5 cm., integra, textura tenuiora, auriculis late rotundatis subincurvis profunde cordata, apice rotundata, emarginata vel mutica, superne aculeolato-papillosa, inferne hirtello-pubescentia; petiolus 1.5–2 cm. longus. *Pedicelli* pubescentes, 6–12 mm. longi. *Flores* solitarii, axillares; perigonium ambitu 28–30 mm. longum, extra pallide griseo-brunneum hirtello-pubescent; utriculus late oblongo-ellipticus, 4–5.5 mm. × 3–4 mm.; tubus tenuis valde sigmoideo-curvatus, ad basin 1.5–1.75 mm. latus, superne sensim ampliatus ad 3.5 mm. latus; limbus oblongo-linguiformis, obtusus, erectus, 6–11 mm. × 5–7 mm., labro inferiore angustissimo 1–1.75 mm. lato, intus (fauce inclusa) glaber lutescentim fuscus lineis 5 atropurpureis striatus. *Ovarium* obovato-clavatum, 2 mm. longum, dense hirtello-pubescent. *Fructus* ignotus.

Persia borealis: in valle fluvii Sefidrud in collibus prope Rudbar, 2–300 m., 5 Mai. 1902, J. & A. Bornmüller 8192 (holo. E, iso. K).—*Endemic*.

This plant was determined by Bornmüller as *A. iberica* F. & M., a Colchic species which had not previously been recorded for Persia. It is, however, probably more closely allied to *A. billardieri* and *A. steupii*; in floral structure it comes closest to *A. billardieri* but differs in its globose (instead of oblong-cylindrical) root, and in its perianth having a glabrous throat. From *A. steupii* it differs in its smaller flowers, of very different colour, the perianth having a glabrous throat and a narrower lower rim. From *A. iberica* it is readily distinguished by its smaller perianth with a narrower rim and by its globose tuber. It is so far known only from the type gathering made near Resht on the Caspian.

7. *A. pontica* Lam., Encyc. i, 255 (1783). Boiss., Fl. Or. iv, 1081 (1879); Gard. Chron. Ser. 3, xxxi, 335 (1902); Sosnowsky in Not. Syst. Geogr. Inst. Bot. Tphilis, Acad. Sc. URSS, Sect. Georgia, fasc. 6: 10 (1939), descr. emend., and p. 8.—Map 1.

Root stoutly cylindrical, shortly branched. *Stems* simple, erect, flexuose, 18–50 cm. tall, minutely hirtellous. *Leaf lamina* 6–16 cm. long, 4.5–12.5 cm. broad, ovate-orbicular with rounded margins, deeply inflexed cordate

MAP 1. Distribution of *Aristolochia* in the Near East.

- | | |
|---------------------------|-----------------------|
| ▲ <i>A. hirta</i> . | □ <i>A. bodamae</i> . |
| ○ <i>A. paecilantha</i> . | ● <i>A. pontica</i> . |

with rounded obtuse auricles 2-4.5 cm. broad, apex usually more or less pointed (rarely obtuse), papillose or more or less pubescent below; petiole 1-6.5 cm. long. *Flowers* solitary, axillary, large. Peduncles 1.5-2.5 cm. long. *Perianth* greenish purple and sparsely hirtellous or hirsute outside, 5.5-11 cm. long; utricle inflated, very broadly oblong, 1.5-2.3 cm. long, 1-1.7 (-2.5) mm. wide; tube U-curved, 5-15 mm. broad at base, gradually dilated towards the top and 12-30 mm. broad; limb cordate-ovate, 25-60 mm. long, glabrous or hirtellous inside, purplish brown (?) or with purplish mottling, apex acute or obtuse, the lower rim divided nearly to the base into 2 obtuse 1-2 cm. long auricles, throat bearing whitish hairs on its lower side. *Ovary* oblong-clavate, hirsute. *Capsule* broadly oblong or pyriform, c. 2.5 × 1.7 cm., pubescent and often with longer scattered hairs. Fl. April-May.

On damp shady places and on sheltered river banks, up to 1500 m.

Type: Levant, *Tournefort* (P, n.v.).

CAUCASUS. Prov. Batum, *Massalsky*. Prov. Batum, ad. stat. viae ferrae Czakwa, in sylvis, Apr.-Mai. 1904, *Novopokrovsky* 33 (LE). Imeretia: Tschoroch, 19 Apr. 1893, leg.? In ruderalis oppide Jurienti, in umbrosis humidis, *Wittmann* (LE). Georgia: Tolakh-Kordan, 800 m., 3 June 1893, *Alboff* 122.

TURKEY. Lazistan: forets des environs de Rhize, May 1866, *Balansa* 357; Çayeli (E. of Rhize), 2 April 1939, *Guichard* T/18/1959. Prov. Ordu: S. of Üniye and Zigara, 900 m., 13 May 1960, *Synge & Furse* 118. "Plantae Trapesondensae", *Turkevicz* a. 1916-1917 (LE). Prov. Giresun: Tamdere—Keslakkaya, Blokchuttlur 4 km. nördlich Tamdere, 1480 m., 1 Jul. 1955, *Huber-Morath* 14255. Erzeroum (Erzurum—Trabzon?), *Zohrab*. Bithynia (Prov. Adapazari): Sabandscha (Sabanja), 14/15 May 1835, *Wiedemann*. Prov. Bolu: Abant-See nw. von Bolu: 1100 m., 18 May 1958, *F. Markgraf*. Prov. Bursa: Olympus—Geukdere, 1500-4000 m., 28 Jun. 1893, *B.V.D. Post* (G).

LEBANON. Abeih (33°45' N, 35°32' E), *Post* 656 (BM, as *A. hirta*).—*Endemic* to the countries cited above.

A. pontica is closely allied to *A. cretica* Lam. from which it differs in its very deeply biauriculate perianth limb and larger, usually glabrescent leaves that are bigger than the flowers. In *Guichard's* specimen the limb is exceptionally acute.

Post's specimen from the Lebanon is the first record for this species outside the Hyrcano-Colchic province, although several species (e.g. *Rhododendron ponticum* L.) show a similar disjunction. The Lebanon specimen has somewhat more hairy leaves and flowers than is usual in Colchic material. The Bithynian specimens mark a considerable extension of its known Black Sea range.

Sosnowsky is wrong in describing the rootstock of *A. pontica* as globose—at least as far as *Balansa's* specimen at Geneva is concerned.

Note:

What appears to be a distinctive new species, probably related to *A. pontica*, was photographed in colour by Mr. K. M. *Guichard* at Ergiz in Turkish Lazistan. This differs from *A. pontica* in its smaller flowers and utricle, more slender tube and very hairy ovate orbicular limb with a ciliate margin, shortly 3-lobed below and emarginate above, and in its shortly petioled, deltoid (staight sided) leaves. In leaf shape it resembles *A. hirta* but the flower structure is different.

8. *A. cretica* Lam., Encyc. i, 255 (1783). Boiss., Fl. Or. iv, 1081 (1879); Ann. Mus. Hist. Nat. Paris, x, t. 18 (1807); Joh. Kerner, Hort. Sempervir.: t. 336 (1811).

Root cylindrical. *Stems* simple or branched, decumbent or erect, 15–45 cm. tall, hirsute. *Leaf lamina* 25–55 mm. long and 20–60 mm. broad, reniform-cordate to cordate-ovate, paler beneath, hirtellous, margin entire or crenulate, apex acute, obtuse or retuse, often mucronate, auricles round, incurved; petiole 5–30 mm. long. *Flowers* axillary, solitary, always larger than leaves. Peduncles longer than petioles (25–65 mm.). *Perianth* 5–12 cm. long, greyish brown and hirsute outside; utricle ovate-oblong, 12–25 mm. long and 9–23 mm. broad; tube U-curved, 7–15 mm. broad at the base, gradually dilated above up to 9–25 mm.; limb ovate-oblong, shorter than tube (18–45 mm.), purplish brown and hirsute with white hairs inside, apex obtuse or retuse, base with 2 small (2–5 mm. long), obtuse auricles. *Ovary* oblong-clavate, hirsute. *Capsule* elliptic-oblong, 3–4 cm. long, hirsute. Fl. March–May.

In screes and in shady places among rocks, ascending to 600 m.

Type: Isle de Candie [Crete], *Tournefort* (P, n.v.).

CRETE. Malaxa: prope Canea, 300 m., 3 May 1938, *Davis* 144; lieux arides, 7 May 1883, *Reverchon* 156. Epanochoria (dist. Hierapetra), 90 m., 12 May 1938, *Davis* 162. Mt. Kavutsi (dist. Sitia), 150–300 m., 14 March 1940, *Davis* 1276; supra Kavutsi, 600 m., Sept. 1938, *Davis & Barneby*. Dist. Mirabello, prope 'Kritsa', May 1900, *Leonis* 4378. Kissamos: lieux arides, 13 Apr. 1884, *Reverchon* (156?).

RHODES. Montis Attairo, 600 m., 16 May 1935, *Rechinger* fil. 7319 (sterile); Monte Prophet Elias (Monte Profeta), prope Salakos, 600 m., 11 Mai 1935, *Rechinger* fil. 7110; montes Akramiti, 600 m., 19 Mai 1935, *Rechinger* fil. 7456. Also recorded from Karpathos.—*Endemic*.

Very close to *A. pontica* Lam. from which it differs in its more rounded pubescent leaves which are smaller than the flowers, and perianth with a shortly biauriculate limb.

9. *A. bodamae* Dingler in Flora, lxvi, 301 (1833). Map 1.

Root cylindrical, 15–20 cm. long and c. 1.5 cm. thick. *Stems* shortly hirtellous, flexuose, simple. *Leaf lamina* 5.5–14 cm. long and 3.5–12 cm. broad, subdeltoid to cordate-hastate, obtuse or acute, mucronulate, paler beneath, shortly hirtellous on both sides, base cordate with widely open sinus, auricles large, subrotund and subincurved; petiole 0.5–3.5 cm. long. Peduncles 3–4 cm. long. *Perianth* (in open flower) 7–8 cm. long, hirtellous and blackish green outside; utricle broadly oblong or ovate-oblong, 8–11 mm. long; tube cylindrical, U-curved, 3–4 mm. broad at base, gradually dilated above to 7–9 mm.; limb 3–4 cm. long and 2.5–3.4 cm. broad, peripherally concave, cordate-ovate, obtuse, base broadly cordate, the triangular sinus 6–8 mm. deep, inside dark purple with paler spots at the tip. *Ovary* 1–1.5 cm. long, linear to subclavate, densely hirsute. *Capsule* not known. Fl. May–June.

Deciduous forest, shady places and fallow fields, up to 1200 m.

Type. Greece: in umbrosis nec non in cultis (solo arenoso) vallis rivi "Bodama Su" inter portum Dedeagatsch dictum et pagum Chyrka Thraciae meridionalis haud raro, 5 Mai 1876, *Dingler* (B—destroyed).

TURKEY. İnönü bei Eskişehir, 15 May 1933, *W. Kotte*. Kastamonu—Küre, 1200 m., 8 June 1954, *Davis* 21713. Bolu, 1835, *Wiedemann*. Torbali (Göynük) et Therukli, 1834, *Wiedemann*. Bolu, Laubmischwald westlich der Stadt, Lehm, 700 m., 17 May 1958, *F. Markgraf*. Endemic to Thrace and N. Anatolia.

It is with some hesitation that these Anatolian gatherings are referred to *A. bodamae*. They differ from the original description in their denser indumentum, smaller leaves (5.5–9 cm. \times 3.5–6.5 cm.) with shorter petioles (5–13 mm.) and leaf base with less open sinus. It seems possible that the small vegetative differences shown by the Anatolian gatherings may be due to less mesophytic habitats. Davidoff has recorded the species (as "*A. Badomae*") from Turkey-in-Europe (Spis. Bulgar. Acad. xii: 1915).

A. bodamae var. *cordifolia* Dingl., described from the same Thracian locality, is said to differ from the typical form of the species in its ovate-cordate leaves and leaf base with broader sinus and much incurved auricles; no such leaf variant occurs in the allied *A. hirta*, and it seems just possible that this taxon may be *A. pontica* which is now recorded from Bithynia.

Turkish material of *A. bodamae* is most closely allied to *A. hirta* Linn. but differs in the leaf base with slightly shorter and less incurved auricles (giving a more open sinus), and particularly in the deep auricles of the perianth limb (a characteristic of *A. pontica*).

10. *A. hirta* Linn., Sp. Pl. ii, 961 (1753). Tournefort, Itin. i, t. 147 (1718); Sibthorp & Sm., Fl. Graeca, x, t. 937 (1840); Jaub. & Sp., Illustr. Pl. Or. i, t. 97 (1844); Boiss., Fl. Or. iv, 1079 (1879).—Map 1.

Syn.: *A. hirsuta* Linn., Syst. ed. 12: 601 (1767).

Root cylindrical. Plants shortly hirsute on all parts. *Stems* erect, simple or branched, 15–50 cm. tall, herbaceous. *Leaf lamina* deltoid to ovate-deltoid, 3–11 cm. long and 2–8 cm. broad with straight margins rarely inflexed in the middle, tip acute or obtuse, often mucronate, paler beneath, base broadly cordate with short round often incurved auricles; petiole 4–25 mm. long. *Flowers* axillary, solitary, large. *Peduncles* 1.5–6.5 cm. long. *Perianth* 3.5–8(–15) cm. long, greyish brown outside; utricle ovate to ovate-oblong, [8–17(–28) mm. \times 5–15(–21) mm.]; tube U-curved, 2–8(–11) mm. broad at the base, gradually dilated above to 7–15(–35) mm.; limb ovate with incurved lateral margins, 1.5–4.5(–8) cm. long, obtuse or retuse at both ends, exauriculate, inside maroon, often with greenish blotches, bearing long pale hairs. *Ovary* clavate. *Capsule* elliptic-oblong. Fl. March–May.

On stony banks at the edge of corn fields, fallow fields, rough ground, vineyards and shady places in pine woods, up to 1200 m.

Type: In Chio, Tournefort (?P, n.v., or Tournefort's figure).

AEGEAN IS. *Chios*: Mastichochera, Kallimasia, 100 m., 9 Apr. 1939, leg. (?) 67; Lithi et Nenita, 10/14 Apr. 1931, *Guiol* 1803; Livadia, 6/18 Apr. 1856, *Orphanides* 707. *Samos*: in monte Ambelos, Arwanitai, 600 m., 10 Apr. 1934, *K. H. & F. Rechinger* 3933; infra Nenedes, 100 m., 6 Apr. 1934, *K. H. & F. Rechinger* 3756; reg. mediae montis Kerki, 700 m., 15 Apr. 1934, *Rechinger* fil. 4160; *ibid.*, 300–900 m., 1 May 1940, *Davis* 1657; Pyrgos, 29 Apr. 1940, *Davis* 1611. *Kalymnos*: 9 Apr. 1887, *Forsyth Major*

592. *Insula Ikaria* (Nikaria): supra Hermas (Kryptragalia prope Hagios Kirykos), 18/24 Apr. 1934, *Rechinger* fil. 4479. *Insula Mytilini* (Lesbos): Montes Lepetymnos, inter Gelia et Ypsilometopon, c. 400 m., 18/24 May 1934, *K. H. & F. Rechinger* 5772; Montes Ordymnos, ad Mon. Ypsilon, c. 500 m., 18/24 May 1934, *K. H. & F. Rechinger* 5887 c.; Montes Amali, ad Hag. Marina ca. 200 m., 18/24 May 1934, *K. H. & F. Rechinger* 5486; in Monte Olympos ad pagum Ajassos, ca. 400–500 m., 19 May 1934, *K. H. & F. Rechinger* 5615.

TURKEY. Olympos Bythino, 1846, *Nöe*. Yechit de Broussa (Bursa), 22 Apr. 1873, *Barbey*. Prov. Muğla: dist. Fethiye, Kalkan, 30 m., 30 Mar. 1956, *Davis and Polunin* (D.25518). Lydia: Smyrna, March 1827, *Fleischer*; *ibid.*: 17 Apr. 1854, *Balansa* 342; *ibid.*: Yamanlar-dagh, 7–900 m., 22 May and 6 June 1906, *J. Bornmüller* 9930. Prov. Çanakkale: Renkoei, Dardanelles, Apr. 1856, leg. (?); *ibid.*, 1883, *Sintenis* 114; in agro Trojano, Mai 1864, *Schmidt*. Pisidia (Prov. Burdur): Tchetlikchi (?), village à 6 hr. au de Bouldour, 21 May 1849, *Heldreich*. Pamphylia (Prov. Antalya): village de Kartsibahir sur le revers oriental du Mt. Solyma (à l'ouest d'Adalia), May 1845, *Heldreich*. Lycia: Myra, *Forbes* 548; Mt. Solyma, a. 1845, *Heldreich*. Phrygia: Yachamichlar-Keui, à 8 km. au nord d'Ouchak, 22 May 1857, *Balansa*.—*Endemic*.

Closely related to *A. bodamae* Dingl.; see description of the latter for differential characters.

If the absence of auricles is not apparent, it is not always very easy to separate *A. hirta* from *A. paecilantha* in the pressed condition. It can, however, be distinguished from the latter in its narrower and shorter perianth limb, usually broader tube, and shorter petioles.

11. *A. auricularia* Boiss., Diagn. Ser. i (5), 49 (1844). Boiss., Fl. Or. iv, 1079 (1879).

Plants dwarfish, crisply pilose or hirsute. *Stems* branched, 5–10 cm. tall above ground. *Leaves* short petioled, oblong-deltoid to broadly deltoid, 10–30 mm. long, 10–45 mm. broad, varying from twice as long as broad to nearly 3 times as broad as long (HM. 8769 and 8770), margin with cartilaginous teeth or papillae, obtuse or acute, often retuse, base cordate with round auricles and an open sinus. *Flowers* axillary, solitary, small to medium. Peduncles short. *Perianth* pinkish brown outside, glaucescent, 25–35 mm. long; utricle round (5–6 mm.); tube slightly curved, slender, 2 mm. broad below, hardly dilated upwards, glabrous or with a few spreading hairs; limb ovate-rotund, 16–20 mm. long, obtuse or retuse, base with short round auricles; inside of the limb dark purplish brown with copious white hairs. *Ovary* obovate to clavate, hirsute. *Capsule* ovate-spherical, 2–2.5 cm. long. Fl. April–June.

In deciduous oak forests on limestone and in fields, 700–1250 m.

Syntypes: Turkey: in Caria interiori unde fliferum retulit *Pinard* aestate 1843 (G, K), fructiferum in planitie Cariensi ad meridiem Cadmi sita Junio 1842, *Boissier* (G).

TURKEY. Lycia: Stenez, *Forbes* 552; Elmali, 14 May 1860, *Bourgeau* 587 (fruct.). Prov. Konya: Bozkir—Hadim, 54 km. nach Bozkir, Gök Çay Tal, Schiefer, 1200–1250 m., 15 Jun. 1948, *Huber-Morath* 8770 (forma foliis latioribus); Hügelrand 14 km. südlich Konya, 1100 m., 6 Jun. 1948,

Huber-Morath 8769. Prov. Mersin d. Gülnar: Bozagaç—Ahirini, between Gülnar and Gilindire, 700 m., 15 Apr. 1956, *Davis* (photo. !—growing with *A. stenosiphon*: D. 26019).

Allied to *A. stenosiphon* P. H. Davis et M. S. Khan, but differing in its dwarfer habit, more or less straight perianth tube which is glabrescent (not puberulent), round utricle, and apex of limb which is obtuse or retuse. Despite its nearly straight tube, on the sum of its characters *A. auricularia* is less closely allied to straight-tubed species than to those with sigmoid tubes; it does in fact, form a link between the two groups.

12. *A. paecilantha* Boiss., *Diagn.* i (12), 104 (1853). Boiss., *Fl. Or.* iv, 1080 (1879); Bouloumoy, Flore Liban and Syrie, t. 391, fig. 2 (1930).—Map 1.

Syn.: *A. scabridula* Boiss., *Diagn.*, I (12): 105 (1853)!

A. hirta Linn. var. *scabrida* Duch., in DC. *Prodr.* xv (1), 494 (1864)!

A. hirta Linn. var. *paecilantha* (Boiss.) Duch., in DC. *Prodr.* xv (1), 494 (1864)!

Stems usually simple, 10–55 cm. tall, hirtellous. *Leaf lamina* crisply puberulent to scabrid, paler beneath, deltoid to ovate-deltoid, 3–13 cm. long and 2–12 cm. broad, margin entire or sinuate, usually undulate, apex acute or obtuse, sometimes mucronate, base widely cordate, auricles round, obtuse, incurved; petiole 7–50 mm. long. *Flowers* medium to large, axillary, solitary. Peduncles 1–5 cm. long. *Perianth* 35–65 mm. long, greenish yellow and hirtellous outside; utricle ovate-oblong (5–12 mm. × 3–10 mm.); tube U-curved, 2–6 mm. broad at the base, gradually dilated above to 4–8 mm.; limb oblong-ovate, 10–45 mm. long and 15–40 mm. broad, apex obtuse rarely acute, inside spotted dark purple and glabrous, rarely hirtellous, base deeply cordate, auricles oblong-concave, obtuse. *Ovary* linear-clavate, pubescent to hirsute. *Capsule* oblong, 3–3.5 mm. long, pubescent. Fl. April–June.

In cornfields, stony fallow fields with calcareous soil on open mountain side, and in shady places in woods, from sea level to 2100 m.

Syntypes: In herbides vallium Samariae (Palestine) in tribu Euphrain, Boissier (G); ad bases Antilibani circa Rascheya (Lebanon), Boissier (G, K, E).

DODECANESE Is. Insule Lero, *Sibthorp* (BM.). This locality requires confirmation—the species is not recorded in Rechinger's *Flora Aegaea* (1943).

TURKEY. Prov. Antalya: Alanya bay, 2 m., 12 Apr. 1956, *Davis & Polunin* (D. 25900); Prov. Hatay: dist. Antakya (Amanus), Antakya—Yayladağ, 5–8 km. S.W. of Şenköy (Şeyhköy), 1000 m., 28 Apr. 1957, *Davis & Hedge* (D. 27163).

IRAQ. Razinook (near Rowanduz), Kurdistan, c. 900 m., 10 May 1933, *Cuckney* (Rustam 3840). Dist. Erbil (Kurdistan) ad radices montis Baradost inter Shanidar et cavernam, c. 800 m., 24 Apr. 1957, *Erdtman & Goedmans* 15646. From round Handiyan village at the foot of the Baradort Mtns., 14 May 1951, *Thesiger* 864.

SYRIA (Anti-Lebanon). Circa Zebdaine prope Damascus, 1200 m., 12 Jun. 1855, *Kotschy* 234; Zebdani, a. 1846, Boissier (type of *A. scabridula*); Djeide [Judeidat-el-Wadi], 30 Apr. 1945, *Whitehorn*; Mt. Hermon, 1200

m., 1863-4, *Lowne*. In monte Garbi (circa Zebdaine prope Damascus), *Kotschy* 30 (G—type of *A. hirta* Linn. var. *scabrida* Duch.).

LEBANON. In regione subalpina jugi Sanin, 1500 m., 15 Jun. 1897, *J. Bornmüller* 145; 1800 m., 18 June 1897, *J. Bornmüller* 1417; ex jugo Montis Libani Djebel Baruk dicto supra Baruk, 1500-2100 m., 24 Mai 1877, *Ball* (2058 ?); ad rupes prope Racheia (Rascheya), in Antilibano, 14 Jun. 1881 (leg. ?) 356; ad Bscherre et circa Cedretum, 1500 m., 21 Jul. 1855, *Kotschy* 282; above Bscherre, 1500-1800 m., 17 Aug. 1945, *Davis* 9840; Montium Libani australis in declivitatibus occidentalibus ad pagum Bhamdum, 9 Jun. 1910, *J. et F. Bornmüller* 12338; ex vertice meridionali Montis Libani Tom Niha dicto, 1500-1850 m., 13 May 1877, *Ball* (1750 ?); Feesen—Houmairi, 24 Apr. 1943, *Davis* 5820. Rechana, W. of Khan Madeiridj, *Gaillardot* 2214. Nebal Assal above Faraya, 1600 m., 18 May 1952, *Mooney* 4386.

PALESTINE. (Galilee): Wadi Tawahin (Safad), 600 m., 3 May 1942, *Davis* 4598; Jermak, 900 m.—1050 m., 9 May 1942, *Davis* 4699.—*Endemic* to the countries cited above.

Most nearly related to *A. bottae* Jaub. & Sp. from which it differs in its \pm simple stems, larger, broader leaves with longer petioles, and in the perianth limb which is oblong-ovate with a usually obtuse apex (instead of acuminate).

The species is very variable in leaf indumentum and in petiole length, perhaps directly controlled by the habitat—D. 4598 and D. 4699 represent opposite extremes of variation from Upper Galilee. Our material does not justify the recognition of *A. scabridula* Boiss. as a separate taxon, even at varietal rank. Some Syrian specimens differ from the type in having a subacute perianth limb.

A. paecilantha is mainly an E. Mediterranean species; it is most common in Lebanon, but evidently reaches Kurdistan. Some of the species variability may possibly be due to hybridisation with *A. bottae*.

12a. *A. paecilantha* Boiss. \times *A. maurorum* Linn.

TURKEY. Prov. Hatay: dist. Antakya (Amanus), Antakya—Yayladağ, near Şenköy, 1000 m., cornfields, hybrid between D. 27160 (*A. maurorum*) and D. 27163 (*A. paecilantha*)?, flowers purplish brown outside, trumpet green inside, mottled purplish brown, flowers hairy outside, 28 Apr. 1957, *Davis* 27164.

Undoubtedly a hybrid between these two species, and intermediate in both flower and leaf; it was collected growing among the parents in a disturbed habitat.

13. *A. bottae* Jaub. et Spach, Ill. Pl. Or. i (10), t. 98 (1844).—Map 2, fig. 1(A).

Syn.: *A. maurorum* Linn. var. *latifolia* Boiss., Fl. Or. iv, 1080 (1879), excl. pl. Cilicica!

Root cylindrical to oblong (vertical, over 1 m. long!). *Stems* branched, erect, 16-50 cm. tall, hirtellous. *Leaf lamina* lanceolate to linear-lanceolate, 2.5-10(-13) cm. long and 1.5-5(-10) cm. broad at the base, puberulous, obtuse or acute, often mucronate, base widely sub-hastate, auricles narrow, oblong-spathulate much longer than broad, widely divaricate; petiole 1-6(-35) mm. long. *Flowers* axillary, solitary, medium to large.

Peduncles 1.5-7.5(-11) cm. *Perianth* 4.5-7.5 cm. long, outside pale brown or greenish brown, glabrous or puberulous; utricle ovate to ovate-oblong (8-18 mm. \times 7-17 mm.); tube U-curved, 4-9 mm. broad at the base, gradually dilated upwards to 6-12 mm.; limb ovate to deltoid ovate, 18-40 mm. long and 19-31 mm. broad, acute or obtuse, rarely retuse, inside spotted yellowish green or light brown, base with 2 distinct round obtuse auricles, hairy at the reddish throat. *Ovary* obovate to oblong-clavate, tomentose. *Capsule* obovate. Fl. March-June.

In cultivated fields, stony waste lands, moist steppe, rocky basalt gulleys, in vineyards, on pale calcareous soil and in shady grasslands among coppiced oaks, ascending up to 2000 m.

Syntypes: In Armenia australiori (prope hodiernam urbem Diarbekir) Botta (P, n.v.), Jaubert (P, n.v.), et in Hyrcania (ad montem Elbourz), Aucher-Eloy (P, n.v.).

CAUCASUS (Azerbaijan): Nachitshevan, dist. Shach-buz, pr. p. Karababa in arvis derelictis, 14 Jun. 1934, *Gadzhiev* (LE).

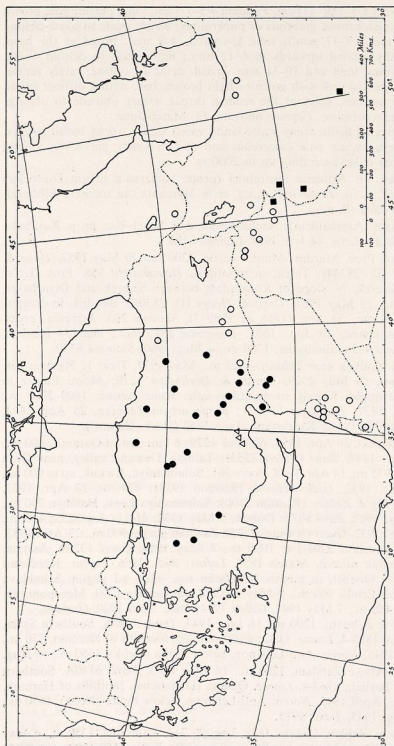
TURKEY. Prov. Mardin: Mardin castle, 1200 m., 20 May 1957, *Davis & Hedge* (D. 28344); Terek, in montibus, *Hausknecht* 858. Prov. Urfa: dist. Siverek, N. slope of Karacadağ, between Siverek and Diyarbakir, 1250 m., 19 May 1957, *Davis & Hedge* (D. 28308). Biredjik, in campos prope Kefre, 30 Apr. (1888 or 1889 ?), *Sintenis* 263. Armenia, prope Gumushkhane, 19 Jun. 1862, *Bourgeau* 234; *ibid.*, champs incultes, *Bourgeau* 465; Gümüşane, 1300 m., 4 May 1960, *Stainton* 8330.

PERSIA. Gulhek near Tehran, 1425 m., May 1933, *Trott* 1; Hasnear Sir, 1500 m., 18 May 1929, *Cowan & Darlington* 1219; Monti Elburz in ditone oppidi Keredj, in montibus calc. Kuhe Nemer, 1600-2000 m., 3 Jun. 1937, *Rechinger* fil. 671; prope urbem Teheran, 25 Apr. 1843, *Kotschy* 72; Persia Kurdistan, June 1852 (Herb. Olguin?).

IRAQ. Jarmo, 26 Apr. 1955, *Helbaek* 1229; 6 km. east of Qaranjir, 800 m., 14 Apr. 1947, *Rawi* (*Gillett* 7555); Talmar, Dawana valley, near Qara Dag, 975 m., 14 Apr. 1958, *Poore* 361; Sulaimaniya, Kirkuk, up to 900 m., 30 Mar. 1932, *Ludlow-Hewitt* (Rustam 1932); 420 m., 13 Apr. 1933, *Guest*, *Eig & Zohary* (Rustam 5100); Soleimaniya Liwa, Halabja, 700 m., 18 Apr. 1947, *Rawi* 8871; Dohuk, 5 May 1932, *Mekki Beg* 3253; 450 m., 24 Apr. 1932, *Guest* (Rustam 2235). Zawitah gorge, 900 m., 23 Apr. 1932, *Guest* (Rustam 2203); c. 1000 m., 7 May 1954, *Guest* 13289. Assyria, Konyemjik ninevit, March 1855, *Loftus*; *ibid.*, 1856, *Loftus*. Kurdistan (Assyria Orient), in montis Kuh-Sefin reg. infer. ad pagum Schaklava (ditionis Erbil), 900 m., 8 May 1893, *J. Bornmüller* 1790. Mesopotamia, Erbil, 450 m., 7 May 1947, *Gillett* 7994; *ibid.*, April 1920, *Graham*.

Above Zebdani, 1200 m., 16 June 1943, *Davis* 6140A. Southern Syria, Barhan, 1863-4, *Lowne*. Qatana (Damascus), foothills of Hermon, 750 m., April 1945, *Norris*. Anti-Lebanon, below Falita (Nebk), 1650 m., 10 Aug. SYRIA. Above Zebdani, 1200 m., 16 June 1943, *Davis* 6140A. Southern Syria, Barhan, 1863-4, *Lowne*. Qatana (Damascus), foothills of Hermon, 750 m., April 1945, *Norris*. Anti-Lebanon, below Falita (Nebk), 1650 m., 10 Aug. 1945, *Davis* 9915.

LEBANON. Zahleh, 15 June 1878, Leg. (?) 743. Yamouna, 1350 m., 6 May 1933, *Meinertzhagen*. Antilibani, supra Baalbek. 1150-1300 m., 20/29 May 1910, *J. et F. Bornmüller* 12339.



MAP 2. Distribution of *Aristolochia* in the Near East.

● *A. maurorum*.

△ *A. cilicica*.

○ *A. bottae*.

■ *A. olivieri*.

PALESTINE. Jerusalem, Ain Kanieh road, 800 m., 23 Mar. 1912, *Meyers & Dinsmore* B. 1119; Jerusalem, 800 m., 6 Apr. 1905, *Dinsmore* 4574; *ibid.*, 800 m., 19 Mar. 1909. *Dinsmore* 5119; Jacob's well, *Hayne*; 11 Mar. 1914, *Meyers* 8574; by the tombs of the Kings, March 1863, *Osborne* 212; Izza (Izra in Syria?), 600 m., 26 Mar. 1932, *Dinsmore* 10574.—Endemic to the countries cited above.

Although recognised as a distinct species in *Fl. URSS.*, 5: 438 (1936), in other Floras *A. bottae* has for long been confused with *A. maurorum*. It is however, certainly specifically distinct, differing markedly both in morphology and distribution from the latter. It may be distinguished from *A. maurorum* by its branched stems, leaves widening more gradually below into shorter, less spreading auricles, and perianth limb that is not abruptly acuminate. Its distribution is more southerly and eastern than that of *A. maurorum* (map 2).

It is certainly also very closely allied to *A. olivieri* Collegno, being distinguished by lanceolate leaves and by the base of the larger perianth limb which is deeply biauriculate. From *A. paecilantha* Boiss. it can be readily distinguished by its branched stems, leaves with narrower blades and auricles, and perianth with broader tube and relatively smaller limb.

A. maurorum var. *latifolia* Boiss. was based on two different species—one specimen of *A. cilicica* (Balansa 766) and four specimens of *A. bottae*.

14. *A. olivieri* Collegno in Boiss., *Diagn. i* (5), 50 (1844). Boissier, *Fl. Or.*, iv, 1079 (1879).—Map 2, fig. 1(b).

Syn.: *A. bruguieri* Jaub. & Spach, *Illustr.*, ii, 40, t. 129 (1845).

Stems erect, branched, 20–45 cm. tall, pubescent. *Leaf lamina* widely deltoid to ovate-deltoid, crisply puberulous, 2.5–6 cm. long and 1.5–9 cm. broad, margin cartilaginous-denticulate, rarely entire, apex acute or obtuse, base widely cordate, auricles more or less divaricate, up to twice as long as broad, round and incurved at the tip; petiole 4–20 mm. long. *Flowers* solitary, axillary, medium to large. Peduncles 1.5–3 cm. long. *Perianth* greenish yellow (drying yellowish-brown) and glabrous or minutely hirsute outside, curved, 2.5–6.5 cm. long; utricle ovate-oblong to round (5–14 mm. \times 4–17 mm.); tube 2–7 mm. broad at the base, gradually dilated upwards to 3–10 mm.; limb 10–25 mm. long and 5–17 mm. broad, ovate-oblong, acute or obtuse, lower rim 2–3 mm. broad, base obsoletely bilobed or emarginate, inside glabrous or sparsely hirsute and often yellowish with purplish markings. *Ovary* oblong-elliptic to obovate-clavate, pubescent. *Capsule* unknown. *Fl.* May–June.

On plains, etc., ascending to 3600 m.

Type: Persia, inter Bagdad et Kermanschah, *Olivier & Bruguère*, in *Herb. DC.* (G, n.v.).

IRAN. Bakhtiari: Damavar, 3600 m., 5 May 1940; *Koelz* 15172; Awal, 1800 m., 1890, *Sawyer* (*Herb. G. Watt* 13118); Bakhtiari mts: Ser-Hup, 9 April 1909, *Gadd* 346 (LE). Persia Kurdistania, June 1852, *Olguin*.

IRAQ. Penjwin, 29 May 1932, *Uvarov*. Endemic to Iran and Iraq.

Very closely allied to *A. bottae* Jaub. et Sp. from which it differs in its deltoid or ovate-deltoid (instead of lanceolate) leaves, often with a horny margin, and in the obsoletely bilobed or emarginate base of the smaller perianth limb. The auricles of *A. bottae*, however, vary considerably in size, so that it is not always easy to separate it from the rarer *A. olivieri*

with whose area it overlaps. Whether *A. olivieri* really represents a distinct species which may hybridise with *A. bottae*, or whether it is only an obsoletely auricled variant of *A. bottae* is a question which only field study can settle. The correlation of leaf and perianth shape, however, leads us to maintain it provisionally at specific rank.

15. *A. maurorum* Linn., Sp. Pl. ed. 2, 1363 (1763). Boiss., Fl. Or. iv, 1080 (1879); Bouloumoy, Flore Liban and Syrie: t. 392, fig. 2 (1930—veg.).—Map 2, fig. 1(D).

Syn.: *A. aucherii* Jaub. & Spach, Illustr. i, 174, t. 99 (1844)!

A. anatolica Boiss., Fl. Or. iv, 1080 (1879), in syn.

Root cylindrical to oblong. *Stems* erect, simple, 15–40 cm. tall. *Leaf lamina* lanceolate to linear-lanceolate, 2.5–8 cm. long and 1.5–5 cm. broad at the base, puberulous, acute or obtuse, often mucronate, base widely sub-hastate, auricles narrow, oblong-spathulate, much longer than broad, widely divaricate; petiole 1–5 mm. long. *Flowers* axillary, solitary, medium to large. *Peduncles* 8–17 mm. long. *Perianth* 2–8.5 cm. long, outside glabrous and dark brown to dark purplish brown, sometimes green; utricle ovate to ovate-oblong (5–15 mm. \times 4–15 mm.); tube U-curved, 2–10 mm. broad at the base, gradually dilated upwards up to 4–13 mm.; limb broadly ovate, 12–40 mm. long and 20–40 mm. broad, apex abruptly acuminate, hairy at the throat, inside dirty green with purplish brown mottling or purplish brown with yellow-green spots, base with two distinct round obtuse auricles. *Ovary* obovate to oblong-clavate, glabrous to sub-tomentose. *Capsule* obovate to oblong. Fl. Febr.–May.

Rocky knolls, limestone slopes, vineyards and steppe, ascending to 1560 m.; often a weed of plateau cultivation.

Type: Circa Halepum (Aleppo), *Rauwolf* (?Leiden, n.v.).

TURKEY. Prov. Kütahya: d. Emet, Gediz—Kütahya, Kalkmergel hügel 52 km. nördlich Gediz, 1050 m., 25 Jun. 1954, *Huber-Morath* 16069. Amasia: in apricis montanis, 6 Mai 1889, *J. Bornmüller* 845. Paphlagonia: Wilajet Kastambuli, Tossia, prope pag. Seko, 25 Mai 1892, *Sintenis* 3960 (forma magna). Prov. Maraş: Ahir dağ above Maraş, 1300–1500 m., 2 May 1957, *Davis & Hedge* (D. 27408); Maraş, 550 m., 30 Apr. 1957, *Davis & Hedge* (D. 27289); Karucaova between Göksun and Maraş, 1300 m., 4 May 1957, *Davis & Hedge* (D. 27537). Prov. Hatay: dist. Antakya (Amanus), Antakya—Yayladağ, 5–8 km. S.W. of Şenköy (Seyhköy), 1000 m., 28 Apr. 1957, *Davis & Hedge* (D. 27160). Caria: a. 1843, *Pinard*. Pisidia: Egirdir, June 1849, *Heldreich*. Prov. Malatya: Mt. above Reşadi, between Doğanşehir and Pazarcik, 1300 m., 10 May 1957, *Davis & Hedge* (D. 27716). Prov. Ankara: Hacikadun valley near Keçiören, 11 June 1952, *Davis & Dodds* (D. 18831); Ankara steppe, 28 May 1932, *Kotte*; Chankaya in Angora 1/15 May 1926, *Lindsay* 38; *ibid.*: 900 m., 12 June 1929, *J. et F. Bornmüller* 14601; *ibid.*, Bala, Küre dağ, 1560 m., 20 May 1959, *Brown*. Gaziantep, 840 m., 17 Apr. 1935, *Balls* 2143; *ibid.*, 1140 m., 13 Apr. 1934, *Balls & Gourlay* (B. 780). Mesopotamia: Biredjik, 30 Apr. 1883, *Sintenis* 263. Phrygia: Ouchak, 910 m., May/June 1857, *Balansa* 1154; *ibid.*, *Balansa* 58. Prov. Kayseri: Talasse, près de Cesarée (Cappadoce), vers 1250 m., *Balansa* 352; Cappadocia Thyanitis, 1300 m., 27 May 1898, *Siehe* 21. Prov. Sivas: Sivas, June 1898, *Maunsell*;

between Suşheri and Refahiye, 870 m., 17 May 1933, *Balls* (B. 260). Anti-Taurus: in montibus Kassan Oghlu ad pagum Görümse, 1200 m., *Kotschy* 51. Asia minor, *Aucher-Eloy* (No. 5292?).

N.W. SYRIA. Inter segeti Aleppo, 390 m., 16 Mar. 1865, *Haussknecht*; within 63 km. of Aleppo, March to July, 1919, *Aldous*; Affrine near Aleppo, 6 Mar. 1952, *Marsh* 28; Aleppo, 24 Mar. 1841, *Kotschy* 39. Syria, *Aucher-Eloy* 2525.—Endemic to Anatolia and N.W. Syria.

Originally described from Aleppo, this is a variable and wide-spread species that is centred in the Irano-Turanian territory of Anatolia. Although a very variable species, it is less variable when one has separated out *A. bottae* with which it has long been confused—for differential characters, see discussion under that species. *A. maurorum* is also very closely allied to *A. cilicica*, differing from it in leaf shape and auriculate perianth limb.

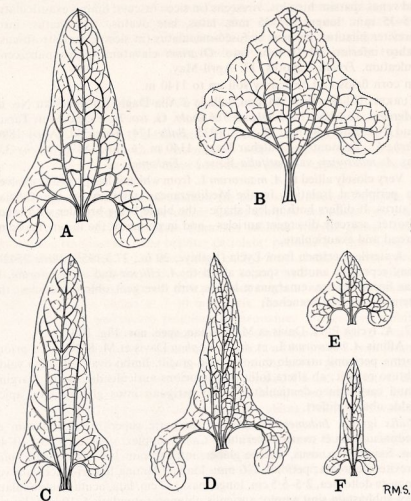


FIG. 1. Leaf shapes of *Aristolochia*. A, *A. bottae*. B, *A. olivieri*. C, *A. cilicica*. D, *A. maurorum*. E, *A. stenosphon*. F, *A. lycica*.

16. *A. cilicica* P. H. Davis et M. S. Khan, *spec. nov.* Map 2, fig. 1(c).

Syn.: *A. maurorum* L. var. *latifolia* Boiss., Fl. Or. iv, 1080 (1879), pro parte Cilicica!

Affinis *A. maurorum* L. sed limbo perigonii haud auriculato, foliis latioribus auriculis brevioribus vix divergentibus recedit.

Radix cylindrica. *Caulis* simplex, breviter hirtellus, erectus, sulcatus, e basi 20–45 cm. altus, inferne glaber, infra terram 1–2-squamosus. *Folia* breviter petiolata, parce asperulo-pubescentia; petiolus 5–10 mm. longus; lamina oblongo-lanceolata acuta vel obtusiuscula mucronulata, mediana 5–12.5 cm. longa, ad basim 2–5.5 cm. lata, basi sinu amplo cordato, auriculis rotundatis latitudine longitudinem aequante, obtusiusculis vix divergentibus. *Flores* axillares solitarii, magni. *Pedunculi* petiolo longiores. *Perigonium* ambitu 4–6 cm. longum; utriculus amplo, ovato-oblongus (8–17 mm. × 7–13 mm.); tubus valde sigmoideo-curvatus ad basim c. 5 mm. latus, superne sensim ampliatus ad 7–11 mm. latus, extra glaber vel ad venas sparsim hirtulus, virescens (in sicco fuscus); limbus exauriculatus 15–35 mm. longus, 15–35 mm. latus, late ovatus, acuminatus, intus breviter hirsutus, carneus et fusco-maculatus (in sicco etiam atrofuscus), labro inferiori ad 10 mm. lato. *Ovarium* clavatum, crispe pubescens, sulcatum. *Fructus* ignotus. Fl. April-May.

In corn fields and on loamy soil up to 1140 m.

TURKEY. Cilicia: Prov. Mersin, village d'Alla Dag, à 7 lieues au No. de Mersina, 16 May 1855, *Balansa* 766 (*holo.* G, *iso.* K, E); between Tarsus and Namrun, 330 m., 14 Apr. 1933, *Balls* 174; Kagiraki, April 1896, *Siehe* 52. In montibus Bulghar Dag, 1140 m., 6 Jun. 1859, *Kotschy* 336 (as *A. maurorum* var. *latifolia* Boiss.).—*Endemic.*

Very closely allied to *A. maurorum* L. from which it has probably evolved in peripheral isolation in the Mediterranean territory of the Cilician Taurus. It differs both in leaf shape—the blade being broader with much shorter, scarcely divergent auricles—and in perianth, the lower rim being broad and exauriculate.

A sterile specimen from Lycia (Fethiye, 30 m., 27.3.1956, *Davis* 25424) may represent another species allied to *A. cilicica* and *A. maurorum*. It has linear-oblong, emarginate leaves with divergent oblong auricles; the stem is sparsely branched.

17. *A. lycica* P. H. Davis et M. S. Khan, *spec. nov.* Fig. 1(f).

Affinis *A. maurorum* L. et *A. stenosphon* Davis et M. S. Khan; a priori forma perigonii utriculo minore, tubo gracili, limbo ovato-oblongo valde obtuso recedit; ab altera foliis angustioribus auriculis divaricatis margine haud cartilagineo-denticulato, limbo perigonii intus glabrescente, apice valde obtuso differt.

Radix ignota. *Indumentum* caulium (in parte superiori) et foliorum et pedunculorum et ovarii puberulum. *Caulis* simplex, sulcatus, e basi 10–40 cm. longus, flexuosus, inferne glaber, infra terram 1–2-squamosus. *Folia* breviter petiolata; petiolus 2–6 mm. longus; lamina lineari-lanceolata vel anguste deltoidea, 2.5–5.5 cm. longa, basi 1–2 cm. lata, acuta, mucronulata basi subhastata sinu amplo, auriculis oblongo-rotundatis 5–10 mm. longis et 3–6 mm. latis basi angustatis divaricatis vel horizontalibus. *Flores* axillares, solitarii, mediocres. *Pedunculi* 1.5–5.5 cm. longi. *Perigonium*

ambitu 2-5.5 cm. longum, in sicco atropurpureum; utriculus ovatus (5-9 mm. \times 3-7 mm.); tubus valde sigmoideo-curved extra sparsim puberulus, ad basim 1-3 mm. latus, superne sensim ampliatus ad 3-7 mm. latus; limbus 2-3.5 cm. longus et 2-3.5 cm. latus, extra et intus glabrescens, ovato-oblongus obtusus, basi in auriculos ovatos acutos vel obtusos (5-10 mm. \times 4-8 mm.) profunde cordatus. *Ovarium* obovatum sulcatum. *Fructus* ignotus. Fl. April.

TURKEY. Lycia (Prov. Antalya): Hafis pasha, 800 m., 12 Apr. 1936, *Tengwall* 286 (holo. K); Sharajiti pass, *Forbes* 549.—*Endemic*.

This species holds an intermediate position between *A. stenosphon* (Cilicia Trachea) and *A. maurorum* (centred in the Anatolian plateau). It differs from *A. stenosphon* in its narrower leaves with divergent auricles but without a horny margin, less dense indumentum of perianth (outside) and leaves, and larger perianth limb, glabrescent inside, with a very obtuse apex. From *A. maurorum* it is readily distinguished by the shape of its flowers—the slender tube, smaller utricle, and ovate-oblong very obtuse limb; the tube is minutely puberulent outside instead of glabrous. *Forbes'* gathering shows a considerable diversity in leaf shape, from narrowly triangular to the narrow blade with horizontal auricles typical of *A. maurorum*.

18. *A. stenosphon* P. H. Davis et M. S. Khan, *spec. nov.* Fig. 1(E).

Affinis *A. lycicae* Davis et M. S. Khan sed foliis deltoideis margine cartilagineo-denticulatis, indumento densiore, limbo perigonii acutiusculo intus hirsuto recedit. Ab *A. auricularia* tubo perigonii valde cruvato graciliore puberulente, apice limbi acutiusculo (haud truncato vel retuso), indumento breviori differt.

Radix ignota. *Indumentum* caulium (in parte superiore) et foliorum et ovarii dense et crispule puberulum. *Caulis* simplex vel pauce ramosus, erectus, e basi 15-20 cm. altus flexuosus sulcatus inferne glaber, infra terram 1-2 squamosus. *Folia* breviter petiolata; petiolus 2-5 mm. longus; lamina subdeltoidea, 1.5-3 cm. longa et 2-3.5 cm. lata, margine parce cartilagineo-denticulata saepe ciliolata, supra medium paulo inflexa, acutiuscula, mucronulata, basi sinu profunde cordata, auriculis rotundatis inflexis 5-10 mm. longis et 7-10 mm. latis. *Flores* axillares, mediocres, solitarii, foetidi, pedunculo petiolum subaequante. *Perigonium* ambitu 3-4 cm. longum, extus atropurpureum; utriculo ovato-oblongo (5-7 mm. \times 3-5 mm.); tubum valde sigmoideo-curvedum, ad basim c. 2 mm. latum, superne sensim ampliatus ad 3-4 mm. latum, extus patentim puberulentum intus glabrum; limbus 1-1.5 cm. longus, 1.3-1.5 cm. latus, late ovatus acutiusculus, basi rotundatim biauriculatus, extus puberulus, intus breviter et pallide hirsutus, ad faucem albo-maculatus. *Ovarium* obovatum, sulcatum. *Fructus* ignotus. Fl. April.

TURKEY. Prov. Mersin (Cilicia Trachea): dist. Gülnar, Bozagaç Ahirini, between Gülnar and Gilindre, deciduous oak forest, on limestone, 700 m., 15 Apr. 1956, *Davis & Polunin* (D. 26019; holo. K, iso. E).—*Endemic*.

Intermediate between *A. lycica* and *A. auricularia*, but probably nearer to the former. It differs from *A. lycica* in its deltoid leaves with a horny margin, the more dense pubescence of its leaves and the outside of its

perianth, and perianth with a smaller acutish limb which is hirsute inside; it also appears to be of dwarfer stature.

In leaf shape it resembles *A. auricularia* but differs in its U-curved tube which is more slender and puberulent (not glabrescent), apex of limb \pm acute instead of obtuse or retuse, utricle ovate-oblong (instead of round), and shorter (but very dense) indumentum of the ovary, stems and leaves; the stems are apparently taller and less branched.

This species was collected by P. H. Davis with *A. auricularia*, of which a kodachrome photograph was taken, *A. stenosphon* being pressed under the hurried impression that it represented a taller version of the plant photographed!

19. *A. incisa* Duch., in DC. Prodr. xv (1), 490 (1864). Boissier, Fl. Or. iv, 1078 (1879).

Syn.: *A. samia* Turrill in Kew Bull. xiv, 108 (1960)!

Root cylindrical. Stems 15–25 cm. tall, simple or branched, slender, shortly hirtellous. Leaf lamina 15–35 mm. long and 12–20 mm. broad, cordate-ovate, base with open sinus and round obtuse auricles, margin cartilaginous denticulate or crisply crenulate, apex obtuse, mucronulate, both sides verruculose, and beneath shortly hirtellous; petiole 4–7 mm. long, hirtellous. Flowers solitary, axillary, medium. Peduncles slightly longer than petioles, briefly pubescent. Perianth 35–40 mm. long, glabrous and brownish purple (in sicco) outside; utricle globose to ovate (c. 5 mm. \times c. 4 mm.); tube U-curved, c. 2 mm. broad below, scarcely dilated above; limb about twice as long as tube, ovate-oblong, hairy inside, apex obtuse or emarginate. Fl. April.

On shady banks up to 300 m.

Type. In Asia occidentali, a. 1837, Aucher-Eloy 2508 (P, n.v.; photo E)! SAMOS Is.: East of the road from Vathy to Pyrgos at a point about 29½ km. from Vathy, April 1959, Goulimis (type of *A. samia* Turrill); Pyrgos, 300 m., 29 Apr. 1940, Davis 1609.—Endemic to Samos and probably W. Anatolia.

Although we could not examine the type specimen of *A. incisa*, we have a photograph of it at Edinburgh. The Samos specimens (recently described as *A. samia* Turrill) match the photograph and description very closely except that the apex of the perianth limb is emarginate instead of “incised and sub-quadrately bilobed”. Despite this discrepancy, we have little hesitation in equating *A. samia* with this little known and very distinctive species whose original locality is unknown; it seems quite possible that Aucher (who did not collect on Samos) discovered it in western Anatolia.

A. incisa has no close allies, but is probably most nearly related to the European *A. pistolochia* which it resembles in the shape of its leaves with their cartilaginous-denticulate margin. It does not, however, have the fasciculate slender roots arising from a very short rhizome characteristic of that species, nor is the tube straight.

20. *A. clematidis* Linn., Sp. Pl. ii, 962 (1753). Spach, Hist. Nat. Veg. phan. Atlas, t. 71 (1846); Reichenbach, Ic. Fl. Germ. xii, t. 669 (1850); Boissier, Fl. Or. iv, 1077 (1879).

Roots slender, arising from a creeping rhizome bearing scale leaves. Stems simple, 15–19 cm. tall. Leaf lamina 2–9 cm. long and 2.5–11 cm.

broad, deltoid-cordate, base with open sinus and round auricles, glabrous, entire, obtuse; petiole 1-5 cm. long. Flowers 2-8 together in the axils. Peduncles much shorter than petioles. Perianth 1.5-3 cm. long, glabrous outside; utricle globose; tube 1-2 mm. broad, more or less straight, yellow to pale greenish yellow outside; limb as long as or shorter than tube, ovate-lanceolate, brownish inside. Ovary clavate, glabrous. Capsule ovate to pyriform. Fl. Febr.-July. In clayey waste ground near rivers, under bushes and trees and on sandy shores; often near sea level.

Described from France and Tartary. Herb. Linn., Herb. Cliff.

GREECE. Macedonia, near the Struma at Kopriva bridge, 19 May 1917, Turrill 273. Thrace, Kouyoukeny, 60 m., 10 June 1930, Tedd 405. Near Erisso, Chalcidica, Febr. 1919, Tozer.

CRIMEA. Tauria: near the village Kokkosi, 4 June/22 May 1906, Wankow; near the river Bijuk-kara-ssu, 13 July 1926, Zyrina. Sebastopol, 1855, Supery.

CAUCASUS. Abkhasia: Sukhumi, 2 m., 11 June 1959, Davis 33630. Prov. Kuban, inter Stavropolskaja et Tchamachinskaja, 4 May 1907, Busch & Klopotov (LE). Batum, May 1885, Smirnow (LE). Majkop, Cauc. borealis, Schestunov 885 (LE). Prov. Kutais prope Poti, in ripariis fl. Rion, 6 May 1902, Alexeenko. Near Novorossisk, Tolcny station, 5 July 1899, D. Dus (LE). Distr. Novorossisk, ain Ardeba valley near Gelenjik, 16 May 1907, D. Lityinov (LE).

TURKEY. Pontus: Trebizond, 27 May 1933, Balls 307; *ibid.*, 24 Jul. 1889, Sintenis 1406. Prov. Çoruh (Artvin): Hopa, 22 Jun. 1957, Davis & Hedge (D. 29874). Prov. Rhize: Çayeli-Pazar, 50 m., 6 Aug. 1957, Davis & Hedge (D. 32044); Rhize (Lazistan), June 1866, Balansa. Giresun, d. Kesap; Giresun—Tirebolu, strand 21 km. östlich Giresun, 2 Jul. 1955, Huber-Morath 14253. Armenia: Calvert & Zohrab. Erzeroum, Zohrab 19. Mesopotamia: Rolland 442.

21. *A. rotunda* Linn., Sp. Pl. ii, 962 (1753). Reichenbach, Ic. Fl. Germ. xii, t. 671 (1850); Boissier, Fl. Or. iv, 1077 (1879); Fiori & Paol., Ic. Fl. Ital. i, t. 110, f. 957 (1898).

Root tuber globose or ovate, often irregular. Stems simple, rarely branched, 15-70 cm. tall, hirtellous. Leaf lamina 2-8 cm. long and 2-6 cm. broad, glabrous or puberulous, sessile (petioles not more than 4 mm. long), margin entire, auricles embracing the stem. Peduncles c. 5 mm. long. Perianth 2.5-3.5 cm. long, glabrous or puberulous and yellow outside; utricle 2-4 mm. broad; tube straight, c. 2 mm. broad at the base; limb as long as tube, oblong, obtuse, dark brown outside, with purple striations inside. Ovary obovate to clavate, puberulous to pubescent. Capsule globose. Fl. April-July.

On plains and mountain slopes, up to 300 m.

Described from Italy, Spain and S. France. Herb. Linn., Herb. Cliff.

GREECE. Hagion-Oros prope Aja-Anna, 300 m., April 1909, Dimonie. Pindus Tymphaeus, July 1885, Haussknecht. South Macedonia: Sithonia (Longos) peninsula, near Armisti, 19 Apr. 1934, Chick & Tedd 2650. Thrace: Palazli, 21 Apr. 1930, Tedd 224. Greek Macedonia: 6 km. N.E. of Lahana Seres road, 19 Apr. 1917, Turrill 62. Macedonia: mt. Kortiatli, June 1906, Adamovic. Central Greek Macedonia: Struma plain and

northern slopes of Krusa Balkan, April/May 1918, *Harris & Turrill* 11. Alpheus near Olympia (Peloponnesus), 27 Apr. 1883, *Halácsy*. Insula Euboea: *Orphanides* 1173. Insula Thasos: 17 May 1891, *Sintenis & Bornmüller* 259. Insula Samothrake: inter Keratia et Therma, 18/20 June 1936, *K. H. & F. Rechinger* 10005.

TURKEY. Recorded by Stoyanoff from Tekirdağ in Turkey-in-Europe (Ann. Univ. Sofia, 8-9: 18 (1914)).

22. *A. pallida* Willd., Sp. Pl. iv, 162 (1805). Sibthorp & Sm., Fl. Graeca, x, t. 936 (1840); Boissier, Fl. Or. iv, 1078 (1879); Hegi, Ill. Fl. Mittel-Europ., iii, 163 (1910).

Syn.: *A. lutea* Desf., Choix. xii, t. 8 (1808).

Root a globose tuber. Stems simple or branched, 10-25 cm. tall. Leaf lamina cordate-ovate to cordate-rotund, 25-40 mm. long and 20-40 mm. broad, glabrous or puberulent, sinuate, obtuse or retuse; petiole 5-10 mm. long. Peduncles 1-3 mm. long. Perianth 25-40 mm. long, greenish yellow and glabrous outside; utricle 3-7 mm. in diameter; tube straight, 1-3 mm. broad at the base, gradually dilated towards the throat, with purple striations inside, the veins showing up faintly on outside; limb as long as or smaller than the tube, oblong-lanceolate, curved forwards and marked with 5-7 purplish brown veins inside which thicken in the throat and sometimes fuse into a triangular blotch (v.v.). Ovary as long as or longer than peduncle, puberulent. Capsule oblong, 1-3 cm. long. Fl. April-May. In loose stones and in woodland up to 1550 m.

Type: Italia, Croatia (Berlin, n.v.).

GREECE. Hagion-Oros prope Aja-Anna, 200 m., April 1909, *Dimonie*. Above Ypati, 1200 m., 11 June 1937, *Balls & Gourlay* (B. 3215). Bakarak, 19 Apr. 1885, leg. (?).

TURKEY. Turquie d'Europe, a. 1845, *Thirke*. Constantinople, *Coumomy*. Mt. Ida, prope Kareikos, 1883, *Sintenis* 749. Sabandscha, 1835, *Wiedemann*. Sivas, dist. Zara, Şerifiye, Yayla-Zara, 1550 m., 4 July 1953, *Huber-Morath* 14254. Asia minor, *Aucher-Eloy* 5243 and 5293. Alma dagh, au nord d'Ouchak (Phrygia), *Balansa* 59. Bolu, Laubmischwald westlich der Stadt, Lehm, 700 m., 17 May 1958, *F. Markgraf*.

Readily confused with *A. longa* when the root is not available. In *A. longa* the flower colour is apparently greenish brown and in *A. pallida* greenish yellow with purplish striations inside, but we have not had the opportunity to compare these very closely allied species in the living state.

23. *A. longa* Linn., Sp. Pl. ii, 962 (1753). Reichenbach, Ic. Fl. Germ. xii, t. 672 (1850); Boissier, Fl. Or. iv, 1078 (1879); Fiori & Paol., Ic. Fl. Ital. i, t. 111, f. 958 (1898); Davis in Bull. Alp. Gard. Soc. vii, 36 (1939).

Syn.: *A. pallida* Willd. var. *elongata* Duch. in DC. Prod. xv (1), 487 (1864)!

A. attica Orphan. apud Duch. in DC., Prodr. xv (1), 487 (1864), in syn. (nom. nud.).

Root fusiform or cylindrical. Stems simple or branched, 5-25 cm. tall, flexuose, minutely puberulous. Leaf lamina cordate-ovate to cordate-rotund, 1.5-5 cm. long and 1.5-6 cm. broad, minutely puberulous, sinuate, obtuse or retuse; petiole 2-15 mm. long. Peduncles as long as

or shorter than petioles. *Perianth* 2.5–4.5 cm. long, greenish brown and glabrous outside; utricle 4–6 mm. broad; tube straight, 1–4 mm. broad at the base, more or less expanded towards the throat; limb smaller than tube, ovate-lanceolate, with 5–7 purplish brown veins inside which often coalesce in the throat. *Ovary* clavate, puberulous. *Capsule* ovoid. Fl. Febr.–May.

In screes, from sea level to 1200 m.

Described from Spain and Italy.

GREECE. Attica: Mt. Parnes, 1050 m., 18 May 1940, *Davis* 1721; *ibid.*, 900 m., 13 Apr. 1938, *Davis* 81; Mt. Parnethis, 1050 m., 9 May 1856, *Heldreich* 1371; in monte Oria (Parnes) Atticae, 300–600 m., 5/17 May 1852, *Orphanides* 127; Mani peninsula near Gerolimena, 17 Febr. 1940, *Davis* 1162; in regione media Montis Malevo, Laconiae, 1200 m., 25 Apr./6 May 1857, *Orphanides* 3350.

It is with some hesitation that we use the name *A. longa* in the generally accepted sense. Linnaeus's diagnosis is insufficient to distinguish between *A. longa*, *A. pallida* and *A. fontanesii*. The specimen named as *A. longa* in the Linnean herbarium (in Linnaeus's own handwriting) is the N. African species later described as *A. fontanesii* Boiss. Linnaeus described *A. longa* from Spain and Italy, but the former locality presumably refers to his var. β ('*Aristolochia longa hispanica*', Bauh. Pin. 307). *A. longa*, as usually interpreted, grows in both Spain and Italy, whereas *A. fontanesii* is absent from Europe. It should be possible to typify the species from the synonymy, notably from Sauvages, Monsp. 111 (1751). In this work Sauvages's description states "*radix napiformis*" and localities near Montpellier are cited. Neither description nor provenance is applicable to *A. pallida* (which is not recorded west of the Rhone), whereas both are consistent with *A. longa* in the generally accepted sense.

This is the only species of *Aristolochia* to reach the Canary Islands (Tenerife) and Madeira.

24. *A. parvifolia* Sibth. & Sm., Fl. Graec. Prodr. ii, 222 (1813). Sibth. & Sm., Fl. Graec., x, t. 935 (1840); Boissier, Fl. Or. iv, 1076 (1879); Boulo-moy, Flore Liban et Syrie: t. 392 (1930).

Syn.: *A. tournefortii* Jaub. & Sp., Ill. Pl. Or. ii, t. 128 (1845).

A. macroglossa Jaub. & Sp., Ill. Pl. Or. ii, t. 127 (1845).

A. tournefortii Jaub. & Sp. var. *macroglossa* (Jaub. & Spach) Boiss., Fl. Or. iv, 1077 (1879).

Root oblong or fusiform. *Stems* simple or branched, filiform, prostrate or ascending. *Leaf lamina* 10–25 mm. long and 5–20 mm. broad, ovate-oblong, with cordate or more or less quadrate base, obtuse or retuse, puberulent at least when young; petiole 1–10 mm. long. Peduncles as long as the petioles. *Perianth* up to 55 mm. long, brown or dusky purple outside; utricle 2–4 mm. in diameter; tube straight, glabrous outside, 1–2 mm. broad at the base, striped; limb at least 2 times longer than tube, linear-lanceolate, up to 35 mm. long, acute or obtuse, often "deep yellowish green". *Ovary* obovate, glabrous or puberulous. *Capsule* spherical 5–20 mm. in diameter. Fl. Febr.–May.

On field banks near sea, basalt screes, stone piles, limestone rocks and crevices, oak-woods, and rocky slopes facing south; from sea level to 900 m.

Type: "Circa Athenas vulgaris; nec infrequens per totam Graeciam", *Sibthorp* (Oxford, n.v.; BM). The locality is certainly erroneous—*Sibthorp* may have collected the plant in Cyprus. In Greece *A. parvifolia* is replaced by *A. microstoma* Boiss.

AEGAEAN IS. Insula Chios: in monte Aepos supra Vrontado, 360 m., 10/12 April 1856, *Orphanides* 708; inter Kardamila et Marmara, 10/14 April 1931, *Herb. F. Guiol* 1802; monte Plaka supra pagum Karies, c. 300 m., 12/14 Mai 1934, *Rechinger fil.* 5405. Insula Phurni: Montis Selada ins. Thimena, 25/26 Apr. 1934, *Rechinger fil.* 4684. Insula Rhodos (Rodi): Montes Akramiti ad Siana, 18 Mai 1935, *K. H. & F. Rechinger* 7425. Insula Samos: in monte Ambelos, ca. 900 bis 1100 m., 10 Apr. 1934, *K. H. & F. Rechinger* 3901; ad "Flammary" prope Vathy, April 1934, *K. H. & F. Rechinger* 3520.

TURKEY. Smyrna: l'île de Kilsali, près de Vourla (golfe de Smyrne), 3 May 1854, *Balansa* 343. Lycia: Olympus, *Forbes* 551; *ibid.*, Antiphelus, *Forbes* 550; Elmali sur les collines, 2 May 1860, *Bourgeau* (as *A. tournefortii*). Prov. Muğla: Marmaris, 5 m., 24 May 1956, *Davis & Polunin* (D. 25312). Prov. Mersin: dist. Tarsus, gorge of Tarsus river between Ulaş and Şamlar, 3 m., 5 Apr. 1957, *Davis & Hedge* (D. 26556). Prov. Adana: dist. Osmaniye, Toprakkale, 80 m., 20 Apr. 1957, *Davis & Hedge* (D. 26914). Supra Terek, Mardin, Mai 1867, *Hausknecht* (sterile).

SYRIA. Leontes, 1863-4, *Lowne*. Inter Aleppo and Alexandrette, 300 m., 3 Mar. 1865, *Hausknecht*; Ain el Beitha, Syr. borealis, 3 Mar. 1865, *Hausknecht*.

LEBANON. Above Hemel, 900 m., *Davis* 5902. Shemlan, 715 m., 24 Mar. 1958, *Maitland* 236.

PALESTINE. Wadi Yarmuk below El Hami, 4 Apr. 1942, *Davis* 4317. Environs de Jerusalem, a. 1861, *Kiener* (as *A. macroglossa*).

CYPRUS. Capo Graeco, 30 Mar. 1862, *Kotschy*, 118. Papho, June 1901, *A. G. & M. E. Lascelles*. Sotira, Ayios Antonios, 120 m., 26 Apr. 1950, *Chapman* 588. Helafka (Kyrenia range), 750 m., 27 Mar. 1941, *Davis* 2823. Aegios Philon, near Rizokarpaso, sea level, 19 Febr. 1941, *Davis* 2277.—*Endemic* to these countries.

It is impossible to separate *A. tournefortii* (described from Chios and recorded by Boissier from W. Anatolia) from the more eastern *A. parvifolia*. The leaves in both species (at least when young) are minutely puberulous, and the proportion of the perianth limb to tube varies independently of locality and vegetative characters. Large-flowered specimens such as those described by Jaubert & Spach from Chios as *A. macroglossa* and reduced by Boissier to a variety of *A. tournefortii*, also occur in Lycia and Cyprus. It seems, however, that these probably represent no more than the mature condition of the flowers in *A. parvifolia*, small-flowered specimens being usually—if not always—immature. The length of the perianth limb can reach 35 mm.

The most closely allied species is the endemic Majorcan *A. bianorii* Sen. et Pau which differs in the rootstock being short and ellipsoidal instead of cylindrical, the leaves longer, the limb shorter than the perianth tube, and the fruiting peduncles longer.

25. *A. microstoma* Boiss. & Spruner, Diagn. i (5), 50 (1844). Boissier, Fl. Or. iv, 1075 (1879); Bouloumoy, Flore Liban and Syrie; t. 392 (1930).

Syn.: *A. parvifolia* Spruner & Duch. in DC Prodr. xv (1), 485 (1864), in syn., non Sibth. & Sm.

Root cylindrical. *Stems* filiform, ascending, simple or branched 10–40 cm. long. *Leaf lamina* ovate-oblong, 1–3 cm. long and 1–2.5 cm. broad, hirtellous, entire or obscurely erosulate, obtuse or retuse; petiole 5–20 mm. long. Peduncles as long as ovaries. *Perianth* 1–2.5 cm. long, glabrous or minutely puberulous and dark brown outside; utricle 2–7 mm. broad; tube sub-curved, 1–4 mm. broad at the base, gradually dilated above into a globose-clavate head that opens by a small lateral pore. *Ovary* obovoid, glabrous or puberulous. *Capsule* sphaerical. Fl. April–May.

On rocky knolls and in dry stony places up to 1000 m.

Syntypes: Greece: in Atticae montibus in lapidosis siccis, in monte Corydalo, *Spruner* (G, E, K, BM); Hymetto frequenter, *Spruner* (G), *Boissier* (G); Citherone inter Eleusim et Theben, *Boissier* (G).

GREECE. Attica, Menidi, April 1876, *Pichler*. m. Hymetti, a regione inferiori usque ad cacumen, 300–960 m., 10 May 1896, *Heldreich* 1372; April 1848, *Heldreich*; 300–750 m., 10 May 1857(?), *Heldreich* 106; prope Athenas (non vulgaris), 90–600 m., 17/29 Mai 1851, *Orphanides* 128. Insula Euboea meridionalis: 3 km. a promontorio Kaphireos occidentem versus, 22 June 1958, *K. H. Rechinger* 18978. Insula Euboea centralis: a pago Vryssi occidentem versus, 18 June 1958, *K. H. Rechinger* 18682.—*Endemic*.

Distinguished from all other Mediterranean species by the lateral pore-like opening of its clavate perianth.

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LIST OF EUROPEAN AND N. AFRICAN SPECIES

NOT INCLUDED IN THIS REVISION

1. *A. baetica* L., Sp. Pl. 961 (1753). (Syn. *A. glauca* Desf.).

From Spain, Portugal, Morocco and Algeria. Closely allied to *A. sempervirens* L.; see the description of the latter for differences.

2. *A. bianorii* Sennen & Pau, Bol. Soc. Arag. Ci. Nat. xi, 246 (1912).

Endemic to Balearic islands. Allied to *A. parvifolia* Sibth. et Sm.; see the description of the latter for distinctive features.

3. *A. croatica* Horvat, Prirod. Istraziv. Kralj Jugoslav. xviii, 195 (1933)—n.v.

Island of Pago, Yugoslavia (n.v.). Closely allied to *A. pallida*.

4. *A. durior* Hill, Veg. Syst. xxi, 57 (1772). (Syn. *A. siphio* L'Her.).

This North American woody climber in Sect. *Siphisia* (Raf.) Duchartre has been reported to be frequently cultivated [cf. Hayek, Prodr. Fl. Pen. Balc. 1: 292 (1927)]; there is a Turkish record from Izmit. It is remarkably distinct from the indigenous species in its three-lobed perianth limb.

5. *A. fontanesii* Boiss. et Reut., Pugillus Pl. Nov. Afr. boi. Hisp. aust. 108 (1852). (Syn. *A. multinervis* Pomel).

Described from Algeria. Allied to *A. longa* L. but differing in its larger broader leaves, larger perianth with a greater number of striations, and cylindrical-pyriform capsules (instead of globose).

6. *A. macedonica* Bornm. in Engl. Bot. Jahrb. lxi (4), 106 (1927). (Syn. *A. melanoglossa* Bornm.).

South Yugoslavia. Very close to *A. pallida*, differing in the perianth being purplish brown outside and the limb broader (holo. B!).

7. *A. paucinervis* Pomel, Nouv. Mat. Fl. Atl., 136 (1874).

Algeria and Morocco. Very closely allied to *A. longa* L., but differing in its ovoid root (instead of cylindrical). Accepted by Emberger and Maire as a subspecies of *A. longa* [subsp. *paucinervis* (Pomel) Batt.], but we have not seen enough N. African material of this critical group to form an opinion.

8. *A. pistolochia* L., Sp. Pl. 962 (1753).

S.W. European—widespread.

9. *A. sicula* Tineo in Guss. Fl. Sic. Syn. ii, 878 (1874).

A Sicilian endemic, apparently very similar to *A. pallida* Willd. and differing only in its leaves with longer petioles and acute to acuminate apex.

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