MATERIALS FOR A FLORA OF TURKEY: XI

NOTES ON TURKISH SPECIES OF HYPERICUM

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The following notes have been occasioned by the production of an account of the genus *Hypericum* L. for the *Flora of Turkey*, Volume 2.

1. Hypericum xylosteifolium (Spach) N. Robson, **comb. nov.**

Hypericum indorum Willd., Sp. Pl. 3 : 1449 (1802) non Miller, Gard. Dict., ed. 8 : No. 6 (1768).

Androsaemum xylosteifolium Spach, Hist. Nat. Vég., Phan. 5 : 420 (1836).

Hypericum ramosissimum Ledeb., Fl. Ross. 1 : 449 (1842) cum formis.

H. rariflorum Stev. ex Rupr., Fl. Cauc. 298 (1869) pro syn.

H. inodorum vars. *subuniflorum*, *intermedium*, *multiflorum* (Ledeb.) R. Keller ex Somm. & Lev. in Acta Horti Petrop. 16 : 93 (1900).

H. inodorum var. *sommieri* R. Keller ex Somm. & Lev., loc. cit.

Willdenow based his *H. inodorum* on Tournefort's *Hypericum orientale, foetido simile, sed inodorum* (Cor. Inst. Rei Herb. 18 (1703)) and described it from Gundelsheimer's set of the Tournefort collection in Berlin. Miller saw no Tournefort material but, having a plant in the Chelsea Physic Garden which resembled *H. hircinum* except for the characteristic scent of that species, apparently assumed that his was the same as Tournefort's plant. Miller's description, however, is based wholly on the plant in his garden which, as an examination of his specimen in Herb. Mus. Brit. has revealed, belongs to the species at present known as *H. elatum* Ait. (Hort. Kew 3 : 104 (1789)). Since both the specimen and the description indicate one species while only the Tournefort citation refers to the other, Miller's *H. inodorum* should be typified by his specimen, and his name must therefore supersede *H. elatum* Ait. for the well-known garden plant. Willdenow's *H. inodorum* thus proves to be a later homonym; the first legitimate name for Tournefort's plant is *Androsaemum xylosteifolium* Spach (1836), for which a new combination in *Hypericum* is supplied above.

2. Hypericum sect. **Heterophyllum** N. Robson, **sect. nov.**

Hypericum sect. *Triadenioides* (sphalm. "Triadenioidea") sensu Stefanov in God. Agron-Les. Fak. Univ. Sofija, 11 : 145 (1933) pro parte quoad species *H. heterophyllum* Vent.

Frutex humilis glaber, ramis erectis, omnino sine glandulis nigris. *Caules* bilineati vel leviter quadrangulares. *Folia* opposita sempervirentia crassiuscula valde difformia sessilia parce pellucido-punctata, venis haud reticulatis. *Inflorescentia* cymosa interdum paniculata, 3–12-floris. *Petala* et staminorum fasciculi post anthesin persistentes. *Stamina* triadelpha. *Ovarium* 3-loculare, loculis 2-ovulatis, stylis 3 patentibus. *Capsula* longitudinaliter vittata. *Semina* punctulata, leviter costulata, ecarinata.

Hyperico sect. *Triadeniae* (sensu lato, sect. *Adenotriade* incluso) affinis sed floribus homostylis, petalis haud appendiculatis, staminibus haud ad mediam conjunctis, sine fasciculis sterilibus, seminibus nec carinatis nec carunculatis, foliis valde difformibus, differt. A sectionibus *Arthrophyllo* et *Triadenioide* ovarii loculis biovulatis et foliis valde difformibus differt.

Type species: *H. heterophyllum* Vent., Jard. Cels.: t. 68 (1800).

Stefanov treated *H. heterophyllum* and a Socotran endemic, *H. scopulorum* Balf. f., as the only species in sect. *Triadeniodea* (sic!) Jaub. & Spach. In Ill. Pl. Orient. 1 : 49 (1842), however, Jaubert and Spach included only one species in their new section, *H. cuneatum* Poir. This species, now known as *H. pallens* Banks & Solander, must therefore be the type of sect. *Triadenioides*. *H. scopulorum* appears to be most closely related to another Socotran endemic, *H. tortuosum* Balf. f., not to *H. heterophyllum* which occupies a rather isolated place in *Hypericum* although obviously allied to *H. russeggeri* (Fenzl) R. Keller (sect. *Triadenia*) and *H. ternatum* Poulter (sect. *Triadenioides*). I therefore think that *H. heterophyllum* should be placed in a monotypic section, for which the name, diagnosis and description are provided above.

H. heterophyllum was described by Ventenat from a specimen which was said to have been collected by Olivier and Bruguière in Iran. Since the end of the 18th century, however, no Iranian records for this species have been published. All the specimens that I have seen (which are listed below) were found in the area to the north and west of Ankara, a region through which Olivier and Bruguière passed on their way eastward. It seems likely, then, that *H. heterophyllum* is endemic to the Galatian and Mysian regions of Anatolia.

TURKEY. A4 Bolu*: Passhöhe südlich von Gerede, 1600 m, fl. 8 viii 1963, *Huber* (BM, WB). A4 Ankara: Kizilcahamam, fl. 6 viii 1899, *Frères E.C.* in *Aznavour* (G); ditto, fl. 5 viii 1957, *Kuhne* 1324 (E); ditto, fl. 6 viii 1909, *Post* (G); 34 km. südöstlich Gerede, Strasse Ankara-Bolu, c. 1600 m, fl. 8 vi 1962, *Borger* T 62/82/20 (E); Ankara-Çamlidere, Çamkoru, 1499 m, fl. 8 viii 1956, *Osman-Alpay* 502 (Herb. Huber-Morath, Basel). B2 Balikesir: Dursunbey, Alaçam Intifa, 1200 m, fl 17 vii 1951, *Güresin* (ISTO). *Unlocalised:* fl. & fr. 12 viii, *Kuhne* 3510 (E); fl. 1896, *Whittall* 816 (K).

3. Hypericum sect. **Drosanthe** (Spach) Endl., Gen. 1032 (1840).

Drosanthe Spach, Hist. Nat. Vég. Phan. 5 : 376 (1836); in Ann. Sci. Nat. Sér. 2, Bot. 5 : 355 (1836).

Eremosporus Spach, Hist. Nat. Vég. Phan. 5 : 374 (1836); in Ann. Sci. Nat. Sér. 2, Bot. 5 : 355 (1836).

Hypericum sect. *Adenosepalum* Spach in Ann. Sci. Nat. Sér. 2, Bot. 5 : 357 (1836) pro min. parte.

Hypericum sect. *Eremosporus* (Spach) Endl., Gen. 1032 (1840).

Hypericum sect. *Hypericum* subsect. *Adenosepalum* (Spach) Endl., loc. cit., pro min. parte.

Hypericum sect. *Taeniocarpium* Jaub. & Spach, Ill. Pl. Orient. 1 : 47 (1842) pro min. parte.

* The Turkish grid references in this paper are those employed in Davis's "Flora of Turkey".

Hypericum sect. *Euhypericum* Boiss. subsect. *Taeniocarpia* (Jaub. & Spach) Boiss., Fl. Orient. 1 : 787 (1867) pro parte.
Hypericum sect. *Euhypericum* subsect. *Homotaenium* R. Keller in Engl. & Prantl, Nat. Pflanzenfam. 3 (6) : 212 (1895) pro parte.
Hypericum sect. *Hyssopifolia* Stef. in God. Agron.-Les. Fak. Univ. Sofija, 11: 178 (1933) pro parte.
Hypericum sect. *Spectabiles* Stef., tom. cit. 182 (1933).
Hypericum sect. *Hirtella* Stef., tom. cit. 183 (1933).
Hypericum sect. *Scabra* Stef., tom. cit. 185 (1933).

The above synonymy shows that *Drosanthe* is the correct name for the section that includes *H. hyssopifolium* Chaix and *H. helianthemoides* (Spach) Boiss. Spach's original list of species in his genus and their correct names in *Hypericum* are as follows:

D. hirtella Spach (*H. hirtellum* (Spach) Boiss.)
D. ledifolia Spach (*H. asperulum* Jaub. & Spach)
D. fimbriata Spach (*H. assyriacum* Boiss.)
D. helianthemoides Spach (*H. helianthemoides* (Spach) Boiss.)
D. ? *hyssopifolia* Spach (*H. scabrum* L.)
D. ? *scabra* (L.) Spach (*H. scabrum* L.)

Since Spach was uncertain that the last two species belonged to *Drosanthe*, the choice of lectotype for Sect. *Drosanthe* should be restricted to the first four in the list. Spach's original description applies equally well to all four, and I therefore nominate the most widespread species, *D. helianthemoides* (Spach) Boiss.), as lectotype.

4. The H. lysimachioides Group. Three closely related species from the south-east of Turkey and adjacent regions which have given rise to some confusion are *H. amblysepalum* Hochst. (Cilicia and Lebanon to N. Iraq), *H. lysimachoides* Boiss. & Noé (S.E. Turkey, N. Iraq, W. Iran) and *H. asperulum* Jaub. & Spach (N. Iraq, W. Iran). They have distinct but overlapping geographical distributions and can be distinguished as follows:

Sepals rounded, suborbicular to oblong or spathulate, with margin glandular–denticulate to shortly fimbriate; superficial* black glands usually completely absent; leaves rounded, glabrous or undulate–papillose above . . . . . *H. amblysepalum*

Sepals acute to obtuse or, if rounded, then with sessile marginal glands and superficial black glands present:

Sepals acute, lanceolate to oblong or spathulate with margin very shortly glandular-denticulate to –fimbriate; superficial black glands sometimes present on some organs; leaves acute or apiculate to obtuse, glabrous or slightly scabrid above or on margins, rarely glaucous *H. lysimachioides*

Sepals obtuse to rounded, oblong with sessile marginal glands; superficial black glands present on petals, stems and (usually) sepals and leaves; leaves rounded, scabrid on margins and usually above, usually glaucous . . . . . *H. asperulum*

H. amblysepalum Hochst. in Lorent, Wander. im Morgenl. 341 (1845)
H. lorentii Hochst., tom. cit. 342 (1845)
H. amanum Boiss., Fl. Orient. 1 : 804 (1867)

* i.e. not marginal or intramarginal.

H. kurdicum Bornm. in Beih. Bot. Centralbl. 28 (2) : 158 (1911)
H. cyclosepalum Rech. fil. in Ann. Nat. Hofm. Wien, 49 : 266, fig. 3 (1939).
H. fieldianum Rech. fil. in Feddes Rep. 50 : 259 (1941)

This species varies clinally from west to east. The forms of *H. amblysepalum* in Palestine, the Levant and W. Turkey have broad glabrous plane leaves, while the forms in E. Turkey and Iraq (*H. cyclosepalum*, *H. fieldianum*) tend to have narrow leaves with revolute margins and papillose-pubescent upper surface. Between these two extremes of its distribution *H. amblysepalum* appears to be scarcer; but the morphological variation is continuous, thus preventing the recognition of these extreme populations as subspecies.

H. lysimachioides Boiss. & Noé in Boiss., Diagn. Spec. Nov., Sér. 2, 1 : 106 (1853)—non Wall., Cat.: no. 4817 (1831) *nom. nud.* nec Wall. ex Dyer, Fl. Brit. Ind. 1 : 254 (1874).

The variation in this species is rather complex owing to the occurrence of forms which approach the other two members of the group as well as (in E. Turkey) *H. spectabile* Jaub. & Spach. The two variants that can be recognised show no marked geographical segregation and are therefore best treated as varieties.

Sepals lanceolate to oblong, with margin denticulate; leaves ovate to narrowly lanceolate . . . . . var. *lysimachioides*
Sepals spathulate, with margin shortly fimbriate; leaves elliptic to broadly oblong . . . . . var. *spathulatum*

var. **lysimachioides**
H. callianthum Boiss., Fl. Orient. 1 : 800 (1867)
H. leichtlinii Stapf ex Bornm. in Feddes Rep., Beih. 89 : 125 (1938)

Sepala lanceolata vel oblonga, margine denticulata; folia ovata vel anguste lanceolata.

Turkey (Upper Euphrates, E. Mesopotamia, Kurdistan), Iraq (Kurdistan), Iran (W.).

var. **spathulatum** N. Robson, **var. nov.** Sepala spathulata, margine breviter fimbriata; folia elliptica vel late oblonga.

TURKEY. B8 Bitlis: Kambos Dağ above Hurmuz, 1800 m, fl. 31 (sic!) vi 1954, *Davis & Polunin* D. 23489 (BM, E, K). B9 Bitlis: Tatvan—Tuğ, 1800 m, fl. 29 vi 1954, *Davis & Polunin* D. 22323b (BM holotype, E, K). C9 Hakkari: Cilo Dağ, in gorge between Cilo yayla and Diz deresi, 2400 m, fl. 10 viii 1954, *Davis & Polunin* D. 24251 (E, K).

IRAQ. Sulaimaniya: Penjwin, 1280 m, fl. 21 vi 1957, *Rawi* in N. H. I. 22564 (K); Kamarspa (between Halabja and Tawela), c. 1840-2000 m, fl. 18 vi 1957, *Rawi* in N. H. I. 22188 (K); Penjwin, 1350 m, fl. 21 vi 1957, *Rawi* in N. H. I. 22060 (K); Montes Avroman ad confines Persiae, in ditione pagi Tawilla, in saxosis calc., 1800–2000 m, fl. 15–18 vi 1957, *Rechinger* 10376 (W).

IRAN. Luristan: Bicheh, 1200m, fl. 20 v 1937, *Køie* 634 (W).

H. asperulum Jaub. & Spach, Ill. Pl. Or. 1 : 60 (1842).
Drosanthe ledifolia Spach, Hist. Nat. Vég. Phan. 5 : 378 (1836) non *Hypericum ledifolium* (Spach) Steudel, Nomencl. Bot., ed. 2, 1 : 788 (1840).
H. nabelekii Stef. in Bull. Soc. Bot. Bulg. 4 : 29 (1931).
H. luristanicum Rech. f. & Køie in Dansk Bot. Arkiv, 15 (4) : 24 (1954–55).
Iraq (Kurdistan), Iran (Kurdistan, Luristan, Azerbaijan).

H. asperulum in its typical form is quite distinct; but in the western parts of its range it approaches *H. amblysepalum* and *H. lysimachioides*, both morphologically and geographically, and one collection (*Gillett* in N. H. I. 8019 (K), from Pirmum Dagh, Salahaddin, Iraq) shows some resemblances to *H. retusum* Aucher. It has not yet been recorded from Turkey.

5. The H. hyssopifolium Group. The members of this group have frequently been confused by students of the Turkish and Russian floras. Although numerous taxa have been described they can be reduced to four, viz. one species, two subspecies and one variety, which differ in the following way:

Sepals equal, not imbricate, acute or subacute, with margin regularly glandular-denticulate or with sessile glands; red or amber stem glands ± numerous, prominent . . . . *H. lydium*

Sepals ± unequal, often imbricate, obtuse to apiculate or rounded, with margin eglandular or with regular or ± irregularly distributed sessile glands; red or amber stem glands absent or small, not prominent (*H. hyssopifolium*):

Sepals subequal, usually imbricate, with margin regularly glandular (petals 7–9 (10) mm.; capsule (5) 6–8.5 mm, broadly ovoid; leaves obtuse, not apiculate) . . . . subsp. *hyssopifolium*

Sepals unequal or, if subequal, not or scarcely imbricate, with margin entire or ± irregularly glandular (subsp. *elongatum*):

Sepals ± imbricate, unequal, with margin entire or irregularly glandular; petals 12–15 mm.; capsule 6–14 mm., ovoid, gradually acuminate; leaves (at least on axillary shoots) apiculate var. *elongatum*

Sepals not or scarcely imbricate, unequal or subequal, with margin regularly glandular or eglandular towards the base; petals 9–12 mm.; capsule 5–7 mm., subglobose, shortly rostrate; leaves obtuse, not apiculate var. *microcalycinum*

H. lydium Boiss., Diagn., Sér. 1, 1 : 57 (1842).
H. sebasteum Boiss. et Noé in Boiss., Diagn., Sér. 2, 1 : 107 (1853).
H. hyssopifolium var. *lydium* (Boiss.) Boiss., Fl. Orient. 1 : 799 (1867).
H. hyssopifolium var. *lythrifolium* Boiss., tom. cit: 800 (1867).
H. adenocladum Boiss., tom. cit.: 802 (1867).
H. ponticum Lipsky in Zap. Keiv. Obshch. Est. 12 : 352 (1892).
H. hyssopifolium subsp. *ponticum* (Lipsky) Woronow in Kusn., Busch & Fomin, Fl. Cauc. Crit. 3 (9) : 29 (1906).
? *H. thethrobicum* Kem.-Nath. in Fl. Gruz. 6 : 233, t. 266 (1950), nom. inval. descr. Georg.

Turkey (widespread in Inner Anatolia except Armenia, Mesopotamia and drier parts of central Anatolia), N. Iraq, W. Caucasus.

H. ponticum Lipsky appears to be an extreme form of *H. lydium* in which the sepals are relatively broad, the inflorescence condensed and the axillary shoots relatively long and ascending. Forms linking it with typical *H. lydium* occur in northern Turkey e.g. *Sintenis* 4520 (Kastamonu, Tosya), *Bornmüller* 186 (Amasya). Although a few specimens from central Anatolia show some characters intermediate between *H. lydium* and *H. hyssopifolium* and may be of hybrid origin, these taxa have quite distinct geographical distributions and are nearly always easily distinguishable morphologically.

H. hyssopifolium Chaix in Vill., Hist. Pl. Dauph. 1 : 329 (1786).
sub sp. **hyssopifolium.**

H. fasciculatum Lapeyr., Hist. Pl. Pyren. 450 (1813)—non Lam., Encycl. Méth. 4 : 160 (1797).

H. diversifolium DC. in Lam. & DC., Fl. France, 6 : 631 (1815).

H. callithyrsum Cosson, Notes Crit. 152 (1852).

H. hyssopifolium subsp. *chrysothyrsum* Woronow in Kusn., Busch & Fomin., Fl. Cauc. Crit. 3(9) : 30 (1906).

H. chrysothyrsum (Woronow) Grossh., Fl. Kavk. 3 : 72 (1932). Morocco, S. & E. Spain, French-Italian Alps, Central Balkans (Bulgaria, Jugoslavia), Crimea, Turkestan (Altai Mts.).

Sub sp. **elongatum** (Ledeb.) Woronow in Kusn., Busch & Fomin, Fl. Cauc. Crit. 3 (9) : 32 (1906).
var. **elongatum.**

H. elongatum Ledeb., Fl. Altaica, 3 : 367 (1831).

H. hyssopifolium var. *elongatum* (Ledeb.) Ledeb., Fl. Ross. 1 : 451. (1842).

H. alpestre var. *giganteum* Kar. & Kir. in Bull. Soc. Nat. Mosc. 15 : 175 (1842).

H. tymphresteum Boiss. & Sprun. in Boiss., Diagn., Sér. 1, 1 : 57 (1842).

H. hyssopifolium var. *latifolium* Boiss., Fl. Orient. 1 : 799 (1867).

H. hyssopifolium var. *tymphresteum* (Boiss. & Sprun.) Boiss., loc. cit Central Greece (Mt. Timfistos), Turkey (central & E. Anatolia). Crimea Caucasus, N. & N.W. Iran, Khorassan, Trans-Caspia, Turkestan.

var. **microcalycinum** (Boiss. & Heldr.) Boiss., Fl. Orient., 1 :800 (1867).

H. apricum Kar. & Kir. in Bull. Soc. Nat. Mosc. 15 : 176 (1842).

H. microcalycinum Boiss. & Heldr. in Boiss., Diagn., Sér. 1, 8 : 115 (1849).

H. karjaginii Rzazade in Dokl. A. N. Azerb. S.S.R. 10 : 882 (1954).
Turkey (central & E. Anatolia), Transcaucasia, N. W. Iran, Turkestan.

Subsp. *hyssopifolium* and subsp. *elongatum* have almost separate distributions which overlap only in the Crimea and Turkestan. Although some plants from S. Spain (*H. callithyrsum* Cosson) tend to have sepals intermediate in form, these two taxa might be treated as species were it not for var. *microcalycinum*. The distribution of this variety lies wholly within that of var. *elongatum* but it is in some respects morphologically intermediate between var. *elongatum* and subsp. *hyssopifolium*. It seems inappropriate to treat var. *microcalycinum* as a separate subspecies, because (a) it does not have a distinct distribution and (b) in some areas where it grows with var. *elongatum* the range of variation between the varieties is almost continuous. I have therefore given it varietal status.

6. H. pseudolaeve N. Robson, **sp. nov.** (Sect. *Drosanthe* (Spach) Endl.).

H. helianthemoidi (Spach) Boiss. affinis, sed capsula maiore breviter rostrata, inflorescentia ampla, folia plerumque undulato-papillosis, differt.

Herba perennis, praeter foliis glabra. *Turiones* steriles procumbentes, c. 9 cm. longi. *Caules* 15–60 cm. longi, erecti, glandulis parvis rubescentibus haud vel vix prominentibus. *Folia* caulina subsessilia vel breviter petiolata, lamina 8–22 mm. longa, anguste oblonga vel linearia, apice rotundata vel breviter apiculata, margine revoluta, pellucido-punctata, vix glauca. *Inflorescentia* late pyramidalis vel cylindrica, multiflora, alabastris globosis. *Sepala* 1.5–3 mm. longa, inaequalia, haud imbricata, oblonga vel lanceolata,

apice acuta vel obtusa vel rotundata, ima basi vel ad 1/3 conjuncta, margine denticulata vel subintegra, regulariter nigro-glandulosa. *Petala* 6–8 mm. longa, nonnihil unguiculata, pellucido-punctata, ad apicem nigroglandulosociliata, lutea, haud rubrotincta. *Stamina* triadelpha, c. 25–40, antheris flavoglandulosis. *Ovarium* ovoideum, triloculare, stylis 3 patentibus. *Capsula* 4–6 mm. longa, globosa vel subglobosa, breviter rostrata, longitudinaliter vittata, loculis c. 3–4-seminatis. *Semina* c. 1·5 mm. longa, fusca, dense papillosa.

TURKEY. A4 Ankara: Hadjikadun valley near Keçiören, fr. 9 vii. 1947, *Davis* 13196 (E, K); Keçiören bei Ankara, fl, & fr. 18 vii 1939, *Romieux* in *Huber-Morath* 540 (Herb. Hub.-Mor. Basel). B4 Ankara: Chankaya, Dikmen Valley, c. 1000 m, fl. v 1926, *Lindsay* 76 (K). B5 Nevşehir: Nevşehir, 1200 m, fl. 21 vi 1962, *Davis, Dodds & Çetik* D. 19085B pp. (B, M, E, K). B7 Malatya: Zwischen Malatya und Arapkir, 95 km. von Malatya, fl. 22 vi 1949, *Reese* (Herb. Hub.-Mor. Basel). B7 Elaziğ: Maden, 1300 m., fl. 2 vi 1957, *Davis & Hedge* D. 29076 (BM E, K,); Kharput, supra Pekenik, in declivit. Mont. Karahaseh, fl. 12 vi 1889, *Sintenis* 746 (E). B7 Erzincan: Foot of Keşiş dağ above Cimin, 1700 m, fr. 26 vii 1957, *Davis & Hedge* D. 31681 (BM holotype, E, K). B8 Erzincan: Gorge between Tercan and Selepur, 1400 m, fl. & fr. 11 vii 1957, *Davis & Hedge* D 30966 (BM, E, K). B8 Erzerum: Mountains between Ilica and Tercan, 2000 m, fl. 10 vii 1957, *Davis & Hedge* D. 30872 (BM, E, K). B8 Siirt: Sirvan-Kurtalan, fl. 24 vi 1954, *Davis* 22171 (BM, E, K). C5 Kayseri: Erdschias-Dagh, Illary-Dagh, c. 1500 m, *Penther & Zederbauer* (n.v.—as *H. helianthemoides**).

H. pseudolaeve appears to grow in dry soils over igneous rocks. It is closely related to *H. rubrum* Hochst. and *H. helianthemoides* (Spach) Boiss., and also shows affinities with *H. thymbrifolium* Boiss. & Noé and *H. amblysepalum* Hochst. It differs from *H. rubrum* in its more elongate inflorescenee and (usually) undulate-papillose leaves which are sometimes shortly apiculate and not glaucous. From *H. helianthemoides* it can be distinguished by its broader inflorescence, usually taller habit, usually undulate-papillose leaves and larger, shortly rostrate capsule.

7. H. rubrum Hochst. in Lorent, Wanderungen im Morgenlande wahrend den Jahren 1842–1843 (Mannheim, 1845). See addendum.

Although Boissier (in Fl. Orientalis) cited the species described by Hochstetter in the Botanical Appendix to the above work, he did not adopt any of Hochstetter's names. A study of Hochstetter's types in the herbarium of the Institut für spezielle Botanik der Universität, Tübingen, has revealed that Hochstetter's *H. rubrum* belongs to the red variety of *H. laeve* Boiss. & Hausskn. and is consequently the earliest name for that species. The necessary nomenclatural changes are as follows:

H. rubrum Hochst. in Lorent, Wander, im Morgenl. 343 (1845)
var. **rubrum**.
Petala aurantiaca vel punicea; sepala atrorubentia.

H. laeve var. *rubrum* (Hochst.) Boiss., Fl. Orient. 1 : 797 (1867) excl. specim. *Kotschy* 141.

* The Penter & Zederbauer record is based on circumstantial evidence, as a plant determined as *H. helianthemoides* from this area is almost certainly *H. pseudolaeve*.

var. Petala lutea; sepala viridia. See addendum.

H. scabrum var. *laeve* Boiss. & Noé in Boiss., Diagn., Sér. 2. 1 : 109 (1853) quoad specim. *Kotschy* 141.

H. laeve Boiss. & Hausskn. in Boiss., Fl. Orient. 1 : 796 (1867) quoad specim. Hausskn.

TURKEY. C. 6 Gaziantep—Nisib, 1·3 km. from Gaziantep, 800 m, fl. 14 v 1957, Davis & Hedge D. 27892 (BM holotype, E, K).

Of the two specimens cited by Boissier & Noé under *H. scabrum* var. *laeve*, *Kotschy* 141 belongs to the yellow-flowered variety of *H. rubrum* rather than to var. *rubrum* (*pace* Boissier in Flora Orientalis), whereas *Noe* s.n. is a smooth-stemmed example of *H. scabrum* L. There is little evidence on which to base the selection of a lectotype other than the convenience of including the variety under the species to which it was attributed. I therefore choose the Noé specimen as lectotype of *H. scabrum* var. *laeve* (see p. 193).

8. H. scabroides Robson & Poulter, **sp. nov.** (Sect. *Drosanthe* (Spach) Endl.)

H. scabro L. affinis, sed caulibus puberulis vel pubescentibus, sepalis plerumque libris vel basi conjunctis differt.

Herba perennis, *Turiones* steriles adscendentes vel procumbentes, 6–11 cm. longi, papilloso-pubescentes. *Caules* floriferi 15–40 cm. longi, erecti vel basi decumbentes, puberuli vel breviter albo- vel brunneo-pubescentes, eglandulosi vel parcissime rubro-glandulosi glandulis haud vel vix prominentibus. *Folia* caulina sessilia vel subsessilia; lamina 7–15 mm. longa, anguste oblonga vel elliptico-oblonga vel linearis, apice rotundata vel subapiculata, margine interdum revoluto, pellucido-punctata sed non nigro-punctata, utrinque papilloso-puberula, haud glauca. *Inflorescentia* corymbosa, multiflora, alabastris globosis, *Sepala* 1·5–3 mm. longa, aequalia, haud imbricata, oblonga vel oblongo-lanceolata, plana vel 3–costata, apice acuta vel obtusa vel rotundata, basi vel ultra medium conjuncta, margine glanduloso-denticulata vel eglandulosa-denticulata vel integra. *Petala* 6–8 mm. longa, breviter unguiculata, parce pellucido-punctata, ad apicem c. 4 glandulis nigris, flava, haud rubrotincta. *Stamina* triadelpha, c. 35–45, antheris flavo-glandulosis. *Ovarium* anguste ovoideum, triloculare, stylis 3 patentibus. *Capsula* 5–8·5 mm. tonga, ovoidea vel subglobosa, haud vel vix rostrata, longitudinaliter vittata, loculis c. 3–5-seminatis. *Semina* 1·2–2 mm. longa, brunnea, dense brevissime tuberculata.

TURKEY. B7 Erzincan: Erzincan—Kelkit, c. 15 km. from Erzincan, 1650 m, fr. 1 viii 1957, *Davis & Hedge* D 31884 (BM, E, K). B7 Tunceli: Pülümür, 1550 m, fl. 8 vi 1957, *Davis & Hedge* D 29270 (BM, E, K); Pülümür, 1600 m, fr. 11 vii 1957, *Davis & Hedge* D 30918 (BM, E, K). B7 Elazig: Maden—Hazar Gol, 1200 m, fr. 22 vi 1954, *Davis* 22051 (BM, E holotype, K).

H. scabroides grows on dry igneous slopes. It is closely allied to the widespread *H. scabrum* L. and shows comparable variation in form. Thus *Davis* 22051 has the habit and eglandular rounded sepals connate to about halfway that are characteristic of small forms of that species: whereas *Davis & Hedge* D 31884 is superficially similar to larger forms of *H. scabrum* but has longer acute glandular-denticulate sepals which are free almost to the base, a condition more extreme than that which occurs in larger forms of *H. scabrum*. In addition, the pubescent or puberulous stem without glandular

eruptions serves to distinguish *H. scabroides* at once, while the paler yellow petals also appears to be diagnostic.

9. H. scabrum L., Cent. Pl. 1 : 25 (1755).

H. capitatum Choisy, Prodr. Monogr. Hypér. 57, t. 9 (1821).

H. asperum Ledeb., Ic. Pl. Ross. 1: t. 17 (1829).

Drosanthe? *hyssopifolia* Spach, Hist. Nat. Vég. Phan. 5 : 380 (1836).

Drosanthe? *scabra* (L) Spach, tom. cit. 381 (1836).

H. cymosum Hochst. in Lorent, Wander. im Morgenl. 342 (1845).

H. scabrum var. *typicum* Trautv. in Bull. Soc. Nat. Mosc. 33 : 457 (1860).

H. scabrum var. *asperum* (Ledeb.) Trautv., loc. cit.

H. scabrum var. *hyssopifolium* (Spach) Boiss., Fl. Orient. 1 : 796 (1867).

H. scabrum var. *micranthum* Boiss., loc. cit.

H. bourgaei Boiss., loc. cit., in synon.

H. scabrum var. *leiocalyx* Kuntze in Act. Hort. Petrop. 10 : 175 (1887).

H. galioides Freyn & Sint. in Bull. Herb. Boiss. 3 : 103 (1895), non Lam. (1797).

H. scabrum var. *bourgaei* Lipsky, Fl. Kavk. : 258 (1899).

H. galiiforme Freyn in Mém. Herb. Boiss., No. 13 : 4 (1900).

The above synonymy applies to the typical form of *H. scabrum* which, though variable in habit, leaf shape, flower and fruit size, and sepal shape and glandularity, always has scabrid stems. Some specimens from scattered localities, particularly in Central Anatolia, have completely smooth stems, which has led to their taxonomic recognition by several authors. Although these Central Anatolian specimens at first glance look somewhat distinct from typical *H. scabrum*, they differ from it only by their smooth stems and are linked to it by a series of specimens with very few glandular emergences on the stem. The other characters of these smooth-stemmed plants show variation parallel to that found in typical forms, except that the Central Antalian ones always have apiculate leaves, a character which is also found in the typical forms and helps to distinguish them from *H. rubrum* var. *luteum*. For these reasons it seems undesirable to give the smooth-stemmed plants formal taxonomic recognition. The following is a list of names that have been applied to this form:

H. scabrum var. *laeve* Boiss. & Noé in Boiss., Diagn., Sér. 2, 1 : 109 (1853), excl. Kotschy 141.

H. laeve Boiss. & Hausskn. in Boiss., Fl. Orient. 1 : 796 (1867), excl. specim. Hausskn.

H. scabrum var. *laevicaule* Stapf, Fl. Lyc., Car., Mesopot. 2 : 20 (1886) (sphalm. "laevicaules").

H. scabrum subsp. *sublaeve* Freyn & Sint. in Oesterr. Bot. Zeitschr. 41 : 364 (1891).

H. scabrum var. *glabrum* B. Fedtsch., Fl. Zap. Tian-Shanya, 1 : 250 (1904).

10. Hypericum sect. **Taeniocarpium** Jaub. & Spach, Ill. Pl. Orient. 1 : 47 (1842).

Neither Keller nor Stefanov adopted the above sectional name. Keller (in Nat. Pflanzenfam. (1895) and ed. 2 (1925)) reduced it to a subsection of his Sect. *Euhypericum*, but changed the name to *Homotaenium* and included in it many species which, in my opinion, belong to other sections. Stefanov (1932–34) ignored the name completely.

The species which Jaubert & Spach originally included belong to five different sections:

Sect. *Hypericum*: *H. anagallidioides* Jaub. & Spach, *H. elegans* Steph. ex Willd.

Sect. *Oligostema* (Boiss.) Stef. (1933): *H. linarifolium* Vahl, *H. australe* Ten., *H. aucheri* Jaub. & Spach.

Sect. *Drosanthe* (Spach) Endl. (1840): *H. hyssopifolium* Chaix, *H. retusum* Aucher, *H. spectabile* Jaub. & Spach, *H. asperulum* Jaub. & Spach.

Sect. *Nummularium* Nyman (1879) nom. nud: *H. repens* sensu Jaub. & Spach, *H. saturejifolium* Jaub. & Spach.

Sect. *Origanifolia* Stef. (1933): *H. avicullariifolium* Jaub. & Spach.

A detailed study of Jaubert & Spach's original description reveals that the species which they studied most intensively was "*H. repens*". As they did not have ripe fruit available for any of the other cited species, they must have coined the name "*Taeniocarpium*" to describe it in particular. The true *H. repens* L., which is a Cyprus endemic at present known as *H. modestum* Boiss., belongs to quite a different section. Jaubert & Spach's plant is *H. linarioides* Bosse, which should therefore be regarded as the type species of Sect. *Iaeniocarpium*. Nyman's Sect. *Nummularium*, which was never provided with a description, thus goes into synonymy.

11. H. saxifragum Robson & Huber-Morath, **sp. nov.** (Sect. *Taeniocarpium* Jaub. & Spach).

H. fragili Heldr. & Sart. Affinis, sed foliis angustioribus, sepalis margine denticulato-glandulosis vel glandulis sessilibus instructo, petalis omnino sine glandulis nigris, differt.

Herba perennis, glabra. *Caules* 3–6 cm. longi, prostrati vel adscendentes, basi ramosi, lignosi, primo 2–lineati, mox subteretes, sine surculis sterilibus axillaribus, glauci. *Folia* petiolata, petiolo c. 0·5 mm. longo, basi articulato; lamina 2-4 mm. longa, anguste oblonga, apice rotundata, basi cuneata vel truncata, margine reflexa indurata, glauca, carnosiuscula, glandulis pellucidis dispersis supra immersis subtus subprominentibus, sine glandulis nigris. *Inflorescentia* 1–3-flora, bracteis ellipticis glandulis nigris marginalibus subsessilibus. *Sepala* 1·5–2 mm. longa, aequalia, imbricata, ovata vel elliptica, apice acute vel obtusa, margine denticulato-glandulosa vel glandulis sessilibus nigris instructa. *Petala* 4–5 mm. longa, basi angustata sed non unguiculata, glandulis pellucidis linearibus vel ad apicem subpunctiformis, onminis sine glandulis nigris, leviter rubrotincta. *Stamina* triadelpha, c. 30, anthero flavo-glandulosis. *Ovarium* c. 1.3 mm. longum, ovoideum, triloculare, stylis 3 patento-adscendentibus. *Capsula* adhuc non visa.

TURKEY. C3 Antalya: Korkuteli Distr., Korkuteli-Elmali, Kalkfels-Ritzen 16 km nach Korkuteli, 1200–1250 m, fl. 24 vi 1948, *Huber-Morath* 8559 (Herb. Hub-Mor., Basel, holotype); Korkuteli Distr., Kizilçal dağ between Korkuteli and Elmali, 1500 m, veg. 7 iv 1956, *Davis & Polunin* D 25740 (BM, E, K).

H. saxifragum grows in fissures of limestone rock. It is most closely allied to *H. fragile* Heldr. & Sart. (from two Greek localities: Mt. Dirphys in Euboea and Mt. Parnes in Attica) and *H. marginatum* Woronow (from Turkish and Russian Lazistan), both of which grow in similar habitats. It differs from both related species in having narrower leaves with pellucid glands scattered

not confined to the margin, petals without black marginal glands, and shorter but relatively broader sepals with marginal glands sessile or shortly stalked.

12. Hypericum sect. Adenosepalum Spach in Ann. Sci. Nat., Sér. 2, Bot. 5 : 357 (1836).

Neither of the two most recent monographers of *Hypericum*, Keller and Stefanov, adopted Spach's name, probably because the species included by Spach in this section are not closely related and should, in my opinion, be distributed among several section as follows:–

Sect. *Reflexa* Stef. (1933): *H. glandulosum* Ait., *H. reflexum* L.f.
Sect. *Hypericum*: *H. elegans* Steph. ex Willd., *H. formosum* Kunth.
Sect. *Oligostema* (Boiss.) Stef. (1933): *H. linarifolium* Vahl.
Sect. *Drosanthe* (Spach) Endl. (1840): *H. hyssopifolium* Chaix, *H. triplinerve* Vent.?
Sect. *Taeniocarpium* Jaub. & Spach (1842).* *H. serpyllifolium* Lam., *H. pulchrum* L., *H. nummularium* L.
Sect. *Humifusoideum* R. Keller (1895): *H. aethiopicum* Thunb.
Sect. *Montana* Stef. (1933): *H. montanum* L., *H. tomentosum* L., *H. suberosum* Salzm., *H. lanuginosum* Lam., *H. lusitanicum* Poir.

Since all these sectional names (except *Drosanthe*) are later than Spach's, it must replace one of them. The description of Sect. *Adenosepalum* applies equally well to all the above species and I therefore propose to adopt this name for the section with the most species represented, Sect. *Montana*. The lecto-type species of Sect. *Adenosepalum* Spach is therefore *H. montanum* L.

13. The H. lanuginosum Group. In the Eastern Mediterranean region the three main species of this group show a geographical replacement pattern: *H. annulatum* Moris (*H. degenii* Bornm.)—central Balkans; *H. atomarium* Boiss.—S. Greece, W. and S. Anatolia eastward to vil. Denizli and western Antalya (one record); *H. lanuginosum* Lam.—Vil. Antalya to Hatay and southward to Sinai, Cyprus. They may be distinguished as follows:

Bracts with densely glandular auricles . . . *H. annulatum*
Bracts not or scarcely auriculate, but sometimes with longer-stalked glands near the base:
Sepals and petals all without superficial (as opposed to marginal) black glands . . . . . *H. lanuginosum*
Sepal and sometimes petals with superficial black glands . *H. atomarium*

In the western part of its range (i.e. in Cilicia). *H. lanuginosum* is most variable, with the variation sometimes tending to approach *H. atomarium*, e.g. the sepals are often relatively narrower and more acute with longer-stalked marginal glands. This may be due in part to introgression from *H. atomarium;* indeed there are several atypical populations in the Antalya area, where the distributions of *H. lanuginosum* and *H. atomarium* meet. However, other tendencies in *H. lanuginosum*, e.g. one towards glabrousness,

* See above, p. 193.

are unlikely to be the direct result of introgression. It seems preferable, then, to regard *H. atomarium* and *H. lanuginosum* as separate species rather than subspecies and to treat the variation within *H. lanuginosum* at the varietal level:

H. lanuginosum Lam., Encycl. Méth. 4 : 171 (1797).

var. **lanuginosum**

H. gracile Boiss., Diagn., Sér. 2, 5 : 70 (1856).

H. lanuginosum var. *gracile* (Boiss.) Boiss., Fl. Orient. 1 : 808 (1867).

H. lanuginosum subsp. *millepunctatum* Holmboe, Stud. Veg. Cyprus, 129 (1914) excl. spec. *Sintenis* 602.

Stem and leaves pubescent or puberulous; sepal margin regularly glandular; plant usually ± robust.

Distribution of species. Continuous variation in (i) sepal width and dentation and (ii) stoutness of the inflorescence make it impossible to distinguish Boissier's variety.

var. **scabrellum** (Boiss.) N. Robson, **stat. nov.**

H. scabrellum Boiss., Diagn., Sér. 2, 5 : 69 (1856).

Stem glabrous or almost so; leaves scabrellous to subglabrous; sepal margin regularly glandular; plant usually ± slender.

Scattered in S. Anatolia.

var. **pestalozzae** (Boiss.) N. Robson, **stat. nov.**

H. pestalozzae Boiss., Diagn., Sér. 1, 8 : 113 (1849).

Stem glabrous or almost so; leaves pubescent or puberulous; sepal margin eglandular; plant usually ± slender.

Apparently confined to the Antalya region. Specimens from Konya Alti and Atbükü Bay are intermediate between var. *lanuginosum* and var. *pestalozzae*.

H. atomarium Boiss., Diagn., Sér. 1, 8 : 114 (1849).

H. lanuginosum subsp. *millepunctatum* Holmboe, Stud. Veg. Cyprus 129 (1914) quoad spec. *Sintenis* 602.

H. supinum Vis. Ill. Piante Grec. Asia Min. : 17 (1842), has been thought to belong to this species. If this is so, then of course *H. supinum* would have to replace *H. atamorium* (1849) as its correct name. The situation, however, is not at all clear.

De Visiani's attempts to identify a specimen from "Circa *Antandro* ad sinum *Golfo d'Adramitti* dictum" (Edremit) led him to believe that it belonged to *H. tomentosum* L., a species of S. France, the Iberian Peninsula and N. Africa. In particular he identified it with Linnaeus's *H. tomentosum* β (of Sp. Pl., ed. 2). Having apparently decided that this taxon merited specific rank, he applied to it a pre-Linnaean name for *H. tomentosum* β–*H. supinum* Clusius, Rar. Stirp. Hisp. 2 : 428—adding a short Latin description, a list of synonyms and a detailed description in Italian. The synonyms (all pre-Linnaean) refer partly to *H. tomentosum* β and partly to *H. elodes* L. ("H. minimum supinum, septentrionale Lobel. *stirp hist.* p. 217."). He then gave a corresponding list of pre-Linnaean synonyms for *H. tomentosum* L. excl. var. β.

De Visiani's intentions are quite clear: to raise the Linnaean *H. tomentosum* var. β to specific rank and include in it his Turkish specimen. The

characteristic of the Linnaean variety is an inflorescence with a terminal flower and two axillary monochasia, an extreme condition in the species but not, in my view, worth even varietal recognition. The Clusius woodcut shows this well (as de Visiani remarks) and most of the other cited pre-Linnaean authors reproduce the same illustration. On the other hand, the only pubescent species of *Hypericum* known from the Gulf of Edremit area is *H. atomarium* Boiss., in which the inflorescence is always paniculate and (unlike that of *H. tomentosum*) glabrous. In addition, the epithet *supinum*, which correctly describes some forms of *H. tomentosum*, does not apply to *H. atomarium*, which is nearly always erect.

The specimen from Edremit was apparently collected by Parolini and Webb in 1819. It has not yet proved possible to locate an annotated specimen from this collection; but with the kind assistance of Prof. R. Pichi-Sermolli, I was able to borrow the specimen labelled "Hypericum supinum" in De Visiani's own herbarium, now at Padua (PAD). This indeed proved to belong to *H. atomarium*. Whether or not it is the specimen cited by de Visiani, it provides further evidence that his concept of *H. supinum* included the species now known as *H. atomarium* Boiss.

Examination of the Latin diagnosis and Italian description of *H. supinum* reveals a mixture of characters of the two species. Thus, ignoring the characters which apply to both, the references to "ascendenti o prostrati tronchi" and "due racemi semplici diritti" indicate a spreading form of *H. tomentosum* such as is depicted in the Clusius woodcut, whereas the more detailed observarions—"racemi . . . privi di peli" and "bracteis oblongis calycisque laciniis obtusis . . . ", [bracts] "prive di peli" and calyx segments "solcate alla base" would apply to *H. atomarium*. It would seem, therefore, that de Visiani's protologue was based on two elements: (i) the description and figures of *H. supinum* Clusius and *H. tomentosum* L. var. β and (ii) a specimen of *H. atomarium* Boiss. I therefore propose that *H. supinum* Vis. be typified by *H. tomentosum* L. var. β, Sp. Pl., ed. 2 1106 (1763), thereby making it a taxonomic synonym of *H. tomentosum* L. The correct name for de Visiani's specimen thus becomes *H. atomarium* Boiss.

14. H. huber-morathii N. Robson, **sp. nov.** (Sect. *Adenosepalum* Spach).

H. minuto Davis & Poulter affinis sed caulibus longioribus erectis, foliis maioribus, floribus numerosioribus, sepalis latioribus haud pellucido-glandulosis apice acutis vel obtusis margine regulariter glanduloso-ciliatis, differt.

Herba perennis, glabra. *Caules* 8–10 cm. longi, erecti, teretes, sine surculis sterilibus axillaribus. *Folia* petiolata vel subsessilia, petiolo ad 0·5 mm. longo vel subnullo, basi haud articulato; lamina 5–9 mm. longa, ovato-oblonga vel late ovata, apice rotundata, basi truncata vel late cuneata, margine plana, subglauca, crassiuscula, glandulis pellucidis numerosis, glandulis nigris submarginalibus numerosis, interdum glandulis nigris superficialibus. *Inflorescentia* 3–12-flora, corymbosa; bracteae oblongae glandulis nigris marginalis subsessilibus munitae vel margine ciliato-glandulosae. *Sepala* c. 2·5 mm. longa, aequalia, imbricata, elliptica vel oblonga, apice acute vel obtusa, margine regulariter ciliato-nigroglandulosa, punctis nigris glandulosis numerosis, haud pelludico-glandulosa. *Petala* 5–7 mm. longa, glandulis nigris submarginalibus, haud pellucido-glandulosa. Stamina

triadelpha, 18–20, autheris nigro-glandulosis. Ovarium 1·5 mm. longum, ovoideo-ellipsoideum, triloculare, stylis 3 patenti-adscendentibus. Capsula immatura vittis longitudinalibus numerosis.

TURKEY. C3 Antalya: Korkuteli Distr, Korkuteli—Elmali, Kalkfelsen 16 km. nach Korkuteli, 1200–1250 m., fl. 24. vi. 1948, *Resse & Renz* in *Huber-Morath* 14986 (Herb. Hub.-Mor., Basel.)

H. huber-morathii grows on limestone rock like *H. saxifragum*, the type of which was collected in the same locality on the same day. It is intermediate between the *H. lanuginosum* group and *H. minutum* Davis & Poulter from Boz Dagh (vil. Denizli), both morphologically and geographically. From *H. minutum* it differs in being larger in all parts and having longer erect stems, more numerous flowers in the inflorescence, broader acute to obtuse sepals with a regularly glandular-ciliate margin but without pellucid glands, petals without pellucid glands and capsule with numerous vittae. It approaches the dwarfer forms of *H. lanuginosum*, but differs *inter alia* in being completely glabrous and smaller in all parts as well as in having superficial black glands on the sepals; and it can be distinguished from the rare glabrous forms of *H. cuisinii* Barbey (to which it bears a superficial resemblance) by its erect habit, broader, thicker leaves with more numerous intramarginal black glands, acute to obtuse sepals, and petals without superficial black glands.

15. Hypericum sect. **Olympia** (Spach) Endl., Gen. Pl. 1033 (1840).

The great variation in this section has resulted in the description of numerous varieties and forms as well as several species. A survey of this group, however, has revealed that, apart from the population on the south side of the Cilician Taurus, the variation is practically continuous and does not allow the recognition of more than one species. The South Anatolian plants are very diverse and at least one more species appears to be present there. The taxa in sect. *Olympia* may be distinguished as follows:

1a Sepals ± long acuminate, usually without black dots; petals usually without superficial black dots; stems erect to prostrate; leaves cuneate to truncate, without or with irregular intramarginal black glands (*H. olympicum L.*):

2a Sepals cuneate or rarely truncate at the base; leaves elliptic to linear subsp. *olympicum*

2b Sepals cordate or auriculate at the base; leaves lanceolate to linear subsp. *auriculatum*

1b Sepals apiculate or acute to rounded, usually black-dotted; petals usually with superficial black dots; stems always erect; leaves cuneate to cordate-amplexicaul, with regular intramarginal black glands (*H. polyphyllum* Boiss. & Bal.):

3a Leaves (at least middle and upper) ovate, cordate-amplexicaul; petals 20-26 mm. long; sepals 15–18 mm. long, apiculate . subsp. *lycium*

3b Leaves triangular-ovate or elliptic to linear, cordate to cuneate; petals 10–20 mm. long; sepals 4–11 mm. long, acute to rounded.

4a Leaves triangular-ovate to triangular-lanceolate, cordate-amplexicaul; sepals 7–11 mm. long, suborbicular . . subsp. *subcordatum*

4b Leaves elliptic to linear, cuneate; sepals 4–6 mm. long, broadly ovate to lanceolate . . . . . subsp. *polyphyllum*

H. olympicum L., Sp. Pl. 784 (1753).

subsp. **olympicum**

H. olympicum var. *latifolium* Sims in Curtis, Bot. Mag. 44 : t. 1867 (1817).
Olympia glauca Spach, Hist. Nat. Vég. Phan 5 : 407 (1836).
Hypericum olympicum var. α Chaub. & Bor., Nouv. Fl. Pélopp. Cycl. 53 (1838).
H. olympicum var. β Chaub. & Bor., loc. cit.
?*H. adenophyllum* Ledeb., Fl. Ross. 1 : 445 (1842).
H. orbiculare Hálacsy in Oesterr. Bot. Zeitschr. 40 : 405 (1890).
H. olympicum forma *major* Hausskn. in Mitt. Thür. Bot. Ver., N. F. 5 : 61 (1893).
H. olympicum forma *minor* Hausskn., loc. cit.
H. macrocalyx Freyn in Bull. Herb. Boiss. 3 : 103 (1895).
H. dimoniei Velen. in Sitz. Böhm. Ges. Wiss. 1910 (8) : 3 (1911).
H. olympicum var. *coronense* Velen., tom cit. (8) : 4 (1911).
H. olympicum var. *dimoniei* (Velen.) Bornm. in Bot. Jahrb. 49 : 432 (1924).
H. olympicum var. *viride* Stef. in Kew Bull. 1931 : 31 (1931).
H. olympicum var. *latifolium* Stef., tom. cit. : 32 (1931), non Sims (1817).
H. olympicum var. *prostratum* Stef., loc. cit.
H. olympicum var. *stenophyllum* Stef., loc. cit.
H. polyphyllum sensu Hayek, Prodr. Fl. Pen. Balc. 1 : 532 (1925), et Hort.
H. repens sensu Hort.
H. fragile sensu Hort.
H. olympicum var. *grandiflorum* Hort.
H. grandiflorum Hort.
H. olympicum var. *citrinum* Hort.
H. citrinum Hort.

Jugoslavia (Serbia), Bulgaria, Greece (mainland, Kefalonia, Euboea, Samothraki, Lemnos, Ikaria), Turkey (Thrace, W. Bithynia, Mysia, Tenedos, Lydia W. Cilicia, Anti-Taurus, Amanus).

Subsp. *olympicum* varies from tall erect large-flowered forms such as that represented by the type specimen from Bithynian Olympus (Uludağ) to decumbent or prostrate small-flowered forms such as forma *minor* Hausskn. (Greece) or var. *prostratum* Stef. (Amanus). Stefanov referred the smaller garden forms (which are frequently misnamed *H. fragile* or *H. repens*) to his var. *prostratum* but, in my opinion, they show a greater resemblance to the montane forms from Greece referable to forma *minor*. Variants of subsp. *olympicum* sometimes form distinct local populations, and it may prove desirable to recognise some of these for horticultural purposes. Var. *stenophyllum* forms a link between subsp. *olympicum* and subsp. *auriculatum*, having the cuneate sepals of the former and the narrow leaves typical of the latter. Although it is nearer subsp. *auriculatum* geographically, similar forms occur within the range of subsp. *olympicum* proper and it is therefore appropriate to place it under the typical subspecies.

Boissier (Fl. Orient. 1 : 791) and subsequent authors, including Gorschkova (Fl. U.R.S.S. 15 : 218), have cited *H. adenophyllum* Ledebour as a synonym of *H. olympicum*, but I have seen no other indications that *H. olympicum* grows in the Caucasus region. Ledebour's description could be applied to it, except the reference to sepals with marginal glands, but it seems unlikely that a plant with such a typical Mediterranean distribution would also occur in the Caucasus.

subsp. **auriculatum** Robson & Huber-Morath, **subsp. nov.** A subsp. *olympico* sepalis basi cordatis vel auriculatis, foliis lanceolatis vel linearibus, differt.

Caules erecti vel decumbentes plusminusve rubescentes. *Folia* 8–21 mm. longa, lanceolata vel linearia, basi cuneata vel truncata vel rare subcordata, haud nigro-punctata vel punctis nigris submarginalibus irregulariter dispositis. *Sepala* 6–14 mm. longa, ovata, basi cordata vel auriculata, interdum parce nigro-punctata, *Petala* 20–30 mm. longa, lutea, haud vel tantum margine nigro-punctata.

TURKEY. C3 Antalya: Manavgat Distr., Manavgat to Akseki, 6·4 km from main road junction, 80 m, fl. 14 vi 1962, *Dudley* D 35753 (E, K); Akseki-Manavgat, 19 km vor Manavgat, 20–30 m, fl. 21 vi 1948, *Huber-Morath* 8094 (Herb. Hub.-Mor., Basel, holotype); Akseki-Manavgat, 47 km südlich Akseki, 250 m, fl. 30 vi 1948, *Huber-Morath* 8093 (Herb. Hub.-Mor, Basel); Manavgat-Alanya, 15 km östlich Manavgat, 20 m, fl. 2 vi 1950, *Huber-Morath* 13817 (Herb. Hub.-Mor., Basel); Manavgat-Alarçayi, fl. 2 vi 1950, *Attila* (E). C4 Antalya: Alanya Distr., Gazipaşa-Anamur, 25 km südlich Gazipaşa, 260 m, fl. 16 v 1956, *Huber-Morath* 13818 (Herb. Hub.-Mor., Basel); Alanya–iza paşa, fl. 4 vi 1950, *Attila* (E); Alanya-Marazli koyu, fl. 2 vi 1950, *Attila* (E).

H. polyphyllum Boiss. & Balansa in Boiss., Diagn., Sér. 2, 5 : 68 (1856)

subsp. **polyphyllum**

H. hayekii Siehe ex Stef. in Kew Bull. 1931 : 32 (1931).

TURKEY. C4 Konya: Karaman-Ermenek, in Gok Çay Tal in südlich Exp., 43 km nach Karaman, 770 m, fl. 12 vi 1948, *Huber-Morath* 8092 (Herb. Hub-Mor., Basel); Karaman-Ermenek, im Gok Su Tal, südlich Exp., 45 km nach Karaman, 550 m, fl. 8 vi 1948, *Huber-Morath* 8091 (Herb. Hub.-Mor., Basel). C4 Icel: Gülnar Distr., Anamur-Gilindire, 48 km östlich Anamur, 110 m fl. 16 v 1956, *Huber-Morath* 13812 (Herb. Hub.-Mor., Basel); Silifke Distr., Gülnar-Silifke, 21 km vor Silifke, 740 m, fl. 17 vi 1950, *Huber-Morath* 13814 (Herb. Hub-Mor., Basel). C5 Içel: Silifke Distr., Silifke-Mersin, 20 km östlich Silifke, e. fr. 17 vi 1950, *Huber-Morath* 13824 (Herb. Hub.-Mor., Basel); Silifke-Mersina, fl. 17 vi 1950, *Attila* (E); beim Dorfe Emirler umweit Mersin, fl. v 1913, *Siehe* 542 (BM, E, type collection of *H. hayekii*); Tchaousli, prés de Mersina, fl. 1 vi 1855, *Balansa* 379 (G); village de Tchaousli prés de Mersina, fl. 1 vi 1855, *Balansa* 673 (BM, E, G holotype of *H. polyphyllum*, G (Post), K).

Until the recent collections of Huber-Morath and Attila, *H. polyphyllum* appears to have been collected only twice, by Balansa and Siehe respectively. There is no evidence that seed or living plants were obtained by either of these early collectors, which suggests that the plants grown in gardens as "*H. polyphyllum*" are misnamed. This is indeed the case. The *H. polyphyllum* of European gardens is an erect small-flowered form of *H. olympicum* subsp. *olympicum*.

subsp. **lycium** Robson & Huber-Morath, **subsp. nov.** A subsp. *polyphyllo* caulibus altioribus, foliis ovatis maioribus cordato-amplexicaulibus, sepalis maioribus concavis, petalis maioribus, differt.

Caules erecti, 30-45 cm. longi. *Folia* superiora usque ad 28 × 15 mm. longa, ovata, basi manifeste cordato-amplexicaulia, herbacea, glandulis nigris submarginalibus regulariter dispositis; folia inferiora minora angus-

tiora, basi truncata vel subcordata. *Inflorescentia* 1–4-floris. *Bracteae* foliis pallidiores, naviculiformes, ad apicem nigro-punctatae. *Sepala* foliis pallidiora, 15–20 mm. longa, late oblongo-elliptica, concava, apice apiculata, ad apicem nigro-punctata. *Petala* 20–26 mm. longa, flavà, ad apicem nigro-punctata.

TURKEY. C3 Antalya: Antalya Distr., Bucht von Tekirova am Fuss des Tahtali Dağ, 5 km landeinwarts, 70 m, fl. 31 v 1950, *Huber-Morath* 13815 (Herb. Hub.-Mor., Basel, holotype); Antalya Distr., Tekirova, fl. 31 v 1950, *Demiriz* (E).

At first glance this plant appears very different from typical subsp. *polyphyllum*; but either the differences are in size only or states intermediate between it and subsp. *polyphllum* occur in subsp. *subcordatum*.
and subsp. *polyphyllum* occur in subsp. *subcordatum*.

Subsp. **subcordatum** Robson & Huber-Morath, **subsp. nov.** A subsp. *polyphyllo* caulibus altioribus foliis superioribus maioribus cordato-amplexicaulibus dense nigro-punctatis, inflorescentia pluriflora, sepalis maioribus, differt.

Caules erecti, 22–52 cm. longi. *Folia* superiora usque ad 16 × 18 mm. longa, ovato-triangularia vel lanceolato-triangularia, basi cordato-amplexicaulia, coriacea, glandulis nigris submarginalibus regulariter dispositis, subtus praeter medium plusminusve dense nigro-punctata; folia inferiora minora angustiora, basi truncata vel subcordata. *Inflorescentia* 4–24-floris. *Bracteae* foliis pallidiores, oblonga, nigro-punctata. *Sepala* foliis pallidiora, 7–11 mm. longa, late ovata vel suborbicularia, concava, apice rotundata, nigro-punctata vel ad medium nigro-striolata. *Petala* 12–18 mm. longa, nigro-punctata vel ad medium nigro-striolata.

TURKEY. C3 Antalya: Alanya Distr., Manavgat-Alaraçayi, fl. 2 vi 1950, *Attila* (E). C4 Icel: Gülnar Distr., Anamur-Gilindire, Brachfeld am Meer, 36 km östlich Anamur, om, fl. 5 vi 1950, *Huber-Morath* 13816 (Herb. Hub.-Mor., Basel, holotype).

Subsp. *subcordatum* is intermediate, morphologically and geographically, between subsp. *lycium* and subsp. *polyphyllum*. A form of the latter from 20 km east of Silifke (*Hub.-Mor.* 13824 and *Attila*) has more flowers than usual and upper leaves markedly truncate at the base, thus tending to approach subsp. *subcordatum*.

16. Hypericum sect. Organifolia Stef. in God. Agron.-Les. Fak. Univ. Sofija, 11 : 166 (1933).

Stefanov characterises this section by capsule valves with dorsal narrow resin canals (vittae) and lateral short swollen canals or glands (vesicles). The discovery of two additional species in this section, *H. imbricatum* Poulter and *H. salsugineum* Robson & Hub.-Mor., has shown the capsule valves to be more variable. Thus, in the taller more floriferous forms of *H. aviculariifolium* Jaub. & Spach the lateral canals are scarcely swollen or interrupted, i.e. they might almost be termed "vittae". In other forms of this species and in *H. origanifolium* Willd. one finds the typical condition, i.e. a few dorsal vittae and more or less swollen and fragmented lateral vesicles. These vesicles are sometimes rather faint so that the sides of the valve appear almost smooth, a condition which approaches that found in *H. salsugineum*, which has a few interrupted dorsal and lateral vittae only. In *H. imbricatum* small latera l

vesicles are usually present and the dorsal vittae are also interrupted. These four species may be distinguished by means of the following key:–

1a Stem pubescent or puberulous:
2a Stem and leaves whitish-pubescent; sepals usually puberulous *H. origanifolium*
2b Stem puberulous; leaves papillose; sepals glabrous *H. avicullariifolium*
1b Stem glabrous:
3a Leaves cuneate to rounded at the base, not usually imbricate, 5–35 mm. long, with intramarginal black glands . . *H. avicullariifolium*
3b Leaves (at least the lower ones) cordate-amplexicaul, densely imbricate, 1–7 mm. long, often without intramarginal black glands:
4a Pedicels absent or up to 0·5 mm. long; inflorescence lax; leaves markedly heteromorphic, without pellucid glands *H. salsugineum*
4b Pedicels c. 1 mm. long; inflorescence capitate; leaves slightly heteromorphic, with numerous pellucid glands *H. imbricatum*

17. H. avicullariifolium Jaub. & Spach, Ill. Pl. Orient. 1 : 59, t. 30 (1842).

This very polymorphic western Anatolian species almost defies attempts at orthodox classification. It can be distinguished from *H. linarifolium* Vahl and *H. australe* Ten. (Sect. *Oligostema*) by the configuration of the glands on the capsule valves (see above) and from the other species in Sect. *Origanifolia* by the characters in the above key. The taxon thus circumscribed, however, is extremely variable. I have allocated the variants to four subspecies with more or less distinct geographical distributions, but the morphological discontinuities among these taxa are not always as marked as one would wish to have at the subspecific level.

1a Stem scabrid to puberulous; leaves papillose . subsp. *byzantinum*
1b Stem glabrous; leaves glabrous to shortly pubescent:
2a Leaves shortly pubescent; petals usually with black glandular streaks subsp. *uniflorum*
2b Leaves glabrous to papillose-puberulous; petals with black glandular dots only:
3a Stem usually erect, (15) 30–60 cm. long; leaves oblong to linear (l/b = 3–6); inflorescence ∞-flowered, pyramidal to narrowly cylindric . . . . . (subsp. *avicullariifolium*)
4a Sepals ribbed, obtuse to rounded or glandular-mucronate; leaves 20–35 mm. long.; petals sometimes white or pinkish var. *albiflorum*
4b Sepals plane, acute or subacute; leaves 10–20 mm. long; petals always yellow, sometimes red-tinged var. *avicullariifolium*
3b Stem usually decumbent to ptostrate, 5–20 (28) cm. long; leaves oblong or elliptic to obovate (1/b = 1·5–3 (4)); inflorescence 1–∞-flowered, pyramidal or cylindric to subcorymbose (*subsp. depilatum*):
5a Stem suberect to ascending; inflorescence usually pyramidal to cylindric, ∞–flowered . . . var. *depilatum*
5b Stem decumbent to prostrate; inflorescence usually subcorymbose to 1–flowered.
6a Sepals acute . . . . . var. *leprosum*
6b Sepals obtuse (plant often small) . var. *bourgaei*

subsp. **avicullariifolium**

A plant of lower altitudes (up to 720 m. or rarely to 1300 m.) in *Pinus brutia* and *Quercus coccifera* woodlands and macchie on limestone.

var. **avicullariifolium**

Lydia, Caria, Lycia, Pisidia.

var. **albiflorum** Hub.-Mor. in Feddes Rep. 52 : 222 (1943).

H. avicullariifolium var. *roseiflorum* Hub.-Mor., loc. cit.

Caria

Although the white- or pinkish-flowered form has a narrower inflorescence than the yellow-flowered one, it does not seem desirable to recognising formae in such a polymorphic species. Further collecting, however, may show them both to be worth varietal rank. The white petals apparently result from the absence of the yellow flavone present in most *Hypericum* petals. Against a white background the presence of the anthocyanin, which frequently produces a red tinge or red veins in yellow petals, gives rise to the pink coloration.

subsp. **depilatum** (Freyn & Bornm.) N. Robson, **comb. nov.**

H. organifolium subsp. *depilatum* Freyn & Bornm. in Oesterr. Bot. Zeitschr. 41 :66 (1891).

H. depilatum (Freyn & Bornm.) Bornm. in Feddes Rep., Beih. 89 : 126 (1938).

A plant of higher altitudes than subsp. *avicullariifolium* (from 800 m, or rarely 500 m, to 2300 m) in dry stony or rocky habitats, usually calcareous.

var. **depilatum**

H. papillare Boiss. & Heldr. in Boiss., Diagn., Sér. 1, 8 : 110 (1849).

H. cymbiferum Boiss. & Bal. in Boiss., Diagn. Sér. 2, 6 : 39 (1859).

H. avicullariifolium var. *cymbiferum* (Boiss. & Bal.) Boiss., Fl. Orient. 1 : 810 (1867).

H. leprosum var. *rigidulum* Boiss., tom. cit. : 811 (1867).

Central Anatolia, Pisidian and Cilician Taurus.

Specimens from Kütahya and Uşak are sometimes intermediate between subsp. *avicullariifolium* and subsp. *depilatum*.

var. **leprosum** (Boiss.) N. Robson, **stat. nov.**

H. leprosum Boiss., Diagn., Sér. 1, 1 : 58 (1842).

Pisidia and Cilician Taurus.

The occurrence of var. *leprosum* in two distinct geographical regions suggests that it may have originated from var. *depilatum* more than once; *Hub.-Mor.* 13820, from Konya, Kadinhan distr., is intermediate between these varieties.

var. **bourgaei** (Boiss.) N. Robson, **comb. nov.**

H. leprosum var. *bourgaei* Boiss., Fl. Orient. 1 : 811 (1867).

H. avicullariifolium forma *viride* Bornm. in Beih. Bot. Centralbl. 24 : 452 (1909).

H. papillare forma *alpinum* Bornm., loc. cit.

H. leprosiforme O. Schwarz in Feddes Rep. 36 : 129 (1934).

Lycian Taurus, Pisidia, Phrygia, Lydia, Lycaonia.

I have not seen the type specimens of the last three synonyms.

subsp. **byzantinum** (Aznavour) N. Robson in Feddes Rep. 73 : 00 (1966).

H. trachyphyllum Griseb., Spic. Fl. Rumel. 1 : 222 (1844).

H. byzantinum Aznavour in Bull. Soc. Bot. Fr. 44 : 166 (1897).

A lowland plant (to 300 m.) of stony habitats.

European Turkey (Istanbul), Bithynia.

Some Bithynian specimens are intermediate between subsp. *depilatum* and subsp. *byzantinum* in having an almost glabrous stem.

subsp. **uniflorum** (Boiss. & Heldr.) N. Robson, **stat. nov.**

H. uniflorum Boiss. & Heldr. in Boiss., Diagn., Sér. 1, 8 : 109 (1849).

A plant of rocky slopes and stony places at high altitudes (1300–2400 m).

Lycaonia, Pisidian Taurus.

The specimens from Sultandağ grow at lower altitudes (1300–1600 m) than those at which the typical Isparta plants are found (2000–2400 m). They are erect and have 3–11 flowers on each stem instead of 1–3 (5), but do not differ essentially in other respects. In habit they form a link between typical subsp *uniflorum* and subsp. *depilatum*.

18. H. salsugineum Robson & Hub.-Mor., **sp. nov.** (Sect. *Origanifolia* Stef.)

H. imbricato Poulter affinis sed pedicellis brevioribus vel nullis, inflorescentia laxa, foliis conspicue heteromorphis haud pellucido-punctatis, habitu erectiore, differt.

Herba perennis, glabra. *Caules* 10–20 cm. longi, e basi decumbenti erecti, basin versus nigro-punctati. Folia sessilia, 1–7 mm longa, superiora maiora lanceolata truncata, inferiora ovata vel suborbiculata cordato-amplexicaulia plusminusve dense imbricata, coriacea, glauca, margine pallidiora, haud pellucido-punctata, haud vel sparsissime nigro-punctata. Inflorescentia laxe corymbosa 2–5-flora vel 1-flora, bracteis oblongis nigro-punctatis margine nigro-glandulosis. *Sepala* 3–4 mm longa, subaequalia, haud imbricata, oblonga, apice obtusa vel rotundata, margine breviter ciliato-nigro-glandulosa vel glandulis sesilibus instructa, nigro-punctata vel nigro-striolata, haud vel sparisissime pelludico-glandulosa. *Petala* c. 8–9 mm. longa, glandulis nigris submarginalibus, apicem versus nigro-punctata, interdum sparse pellucido-punctata vel pelludido-striolata. *Stamina* triadelpha, c. 30, anthero nigro-glanduloso. *Ovarium* c. 3 mm longum, ovoideum, triloculare, stylis 3 adscendentibus. *Capsula* immatura vittis longitudinalibus interruptis plurimis.

TURKEY. C4 Konya: Tuz gölu Dondurma köyü civari, Tuzlu bataklik, c. 900 m, fl. i viii 1952, *Birand & Kasapligil* 747 (ANK, n. v.; Herb. Hub.-Mor. Basel, holotype).

H. salsugineum appears to grow in a region of salt marshes. It provides a morphological and geographical link between the forms of *H. avicullariifolium* in the Sultan dağlari (north-west of Konya) and *H. imbricatum* Poulter from the mountainous region between Ermenak and Anamur.

ADDENDUM

Further research has shown that *H. capitatum* Choisy (1821) is not a synonym of *H. scabrum L.* but must replace *H. rubrum* Hochst. (1845). The type specimen (probably from Aleppo, not Baghdad as Choisy states) appears to belong to the red variety. The name of the yellow variety must therefore be

H. capitatum Choisy var. **luteum** N. Robson, **var. nov.**