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Studies in the genus *Hypericum* L. (Guttiferae) 6. Sections 20. *Myriandra* to 28. *Elodes*

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Synopsis. Following citation of the type of a new subspecies (*H. silenoides* subsp. *minus* N. Robson) omitted from Part 8, those sections of *Hypericum* directly related to sect. 1. *Campylosporus* that were not treated in Part 3 are considered, as well as sects 22. *Arthrophyllum* and 28. *Elodes*, which are closely related respectively to sects 21. *Webbia* and 27. *Adenosepalum*. A discussion of the morphology, chromosome numbers, hybrids, distribution and evolution of each section is followed by a systematic account of the 81 species in total that they contain.

Sect. 20. *Myriandra* is divided into five subsections: subsect. *Centrosperma* R. Keller, subsect. *Pseudobrathydium* R. Keller, subsect. *Suturosperma* R. Keller, subsect. *Brathydium* (Spach) R. Keller and subsect. *Ascyrum* (L.) N. Robson **stat. nov.**, all additional to or with circumscriptions different from those in Adams's 1962 paper; and *H. tenuifolium* Pursh replaces *H. reductum* W.P. Adams.

Sect. 27. *Adenosepalum* is divided into four subsections: subsect. *Aethiopica* N. Robson, subsect. *Pubescentes* N. Robson, subsect. *Caprifolia* N. Robson and subsect. *Adenosepalum*; and *H. joerstadii* Lid is treated as a hybrid, *H. glandulosum* × *reflexum*.

INTRODUCTION

This part (Part 6) of the *Hypericum* monograph includes treatments of the remaining sections directly related to the mainly African Sect. 1. *Campylosporus* (sects 20–28), sects 2–3 having been treated in Part 3 (Robson, 1985) and sects 29–30 in Parts 7 and 8 (Robson, 1987, 1990). Parts 4 and 5 will include the remaining sections, all directly related to the Asian sect. 3. *Ascyreia* (sects 7–19).

Before turning to the main concern of this part, however, it is necessary to remedy a nomenclatural omission in Part 8. The type of *Hypericum silenoides* subsp. *minus*, endemic to the Galapagos Islands (Robson, 1990: 90), should have been cited as:

Ecuador, Galapagos Islands, Albermarle Island [Isabella], 825 & 945 m, 28 August 1905 (fl), *Stewart* 2064 (BM!-holotype; GH!, K!, MO!-isotypes).

Separation of sects *Adenosepalum* and *Humifusoideum* from the rest of Keller's sect. *Euhypericum*

Sects 20–28 fall into six quite distinct groups, each related directly to sect. 1. *Campylosporus*: (i) 20. *Myriandra*, with 2–5 styles ± appressed, stamens apparently not fasciculate and black glands absent; (ii) 21. *Webbia* and its derivative 22. *Arthrophyllum*, with 3 styles spreading from non-contiguous bases, stamens '3'-fasciculate, black glands absent or present and leaves ± broad with densely reticulate venation; (iii) 23. *Triadenioides*, with 3 styles spreading from contiguous bases, stamens '3'-fasciculate, black glands present only in the most derived species and leaves broad (but without clearly reticulate venation) to ± microphyllous; (iv) 24. *Heterophylla* and 25. *Adenotrias*, with 3 styles spreading from contiguous bases, stamens '3'-fasciculate, black glands absent and leaves microphyllous; (v) 26. *Humifusoideum*, with 3–5 styles spreading from contiguous bases, '3'–5 rather indefinite stamen fascicles, black glands usually present and leaves broad; and (vi) 27. *Adenosepalum* and its derivative 28. *Elodes*, with 3 styles spreading from contiguous bases, '3'-fascicled stamens, black (or red in sect. 28) glands present and leaves broad. The distributions of these groups are: Group (i) Eastern N. America, eastern Mexico, Belize, Guatemala, Honduras Republic, Greater Antilles, Bahamas, Bermuda; (ii) Macaronesia, eastern Mediterranean; (iii) Socotra, SW Turkey, Levant; (iv) NW Africa, Mediterranean, NW Turkey; (v) New Guinea, Luzon, Taiwan, Sumatra, Java, S. Africa to Ethiopia and Equatorial Guinea, Madagascar; (vi) Macaronesia, Africa, W. Arabia, Europe, W. Caucasus, W. & S. Turkey, Levant. Note that tropical and east Asiatic species hitherto included in sect. *Adenosepalum* belong in fact to sect. *Hypericum* sensu lato (see below).

Although each of these groups is easily distinguishable from the others, members of sects 26 (Group v) and 27 (Group vi) have often been included in a broad sect. *Euhypericum* Boiss., for example by Keller (1925: 177). Keller placed such species in his subsect. *Homotaenium*, by far the largest subsection in the section, which contained most of the species with narrow continuous longitudinal vittae on the capsule valves. Attempts to rationalize this heterogeneous agglomeration of species were made by Stefanoff (1932–34) and Kimura (1951), both of whom divided it into sections, and by Gorschkova (1949), who retained Keller's subsect. *Homotaenium* but divided it into 15 series. In Part 1 of this work (Robson, 1977*a*), I distributed Keller's species among sections 8, 9, 14, 17, 18, 26 and 27. Sects 17. *Hirtella* and 18. *Taeniocarpium* are distinguished among these by having no regular intramarginal row of black glands on the leaves and seeds with a smooth to papillose testa; in sect. 8. *Bupleuroides* the leaf pairs are connate and glabrous and the styles basally appressed; and in sects 9. *Hypericum* and 14. *Oligostema* the petals become (roughly) erect after flowering, not tightly twisted round the developing ovary as in sects 27. *Adenosepalum* and 28. *Elodes*. Sect. *Adenosepalum* is therefore distinguishable among species of 'sect. *Homotaenium* Boiss.' by the combination of free leaf pairs with inframarginal black glands (or if leaf pairs are connate they are pubescent), petals twisting round the developing fruit, 3 distinct stamen fascicles (cf. sect. 26. *Humifusoideum*) and seeds with a linear-reticulate to scalariform testa. The presence of an indumentum in many species distinguishes these from members of sects 9 and 14, whilst the widespread occurrence of flat-topped sepal marginal glands in sect. *Adenosepalum* is paralleled only in some species of sect. 17. *Hirtella*. Sect. 28. *Elodes* is differentiated from sect. *Adenosepalum* principally by the floral modifications towards specialized insect pollination, but also by the red marginal sepal glands, the ribbed-scalariform seed testa and almost always by the absence of inframarginal black leaf glands.

Circumscription of sect. *Adenosepalum*

When the foregoing criteria were considered, it became clear to me that the Himalayan, south Indian and Chinese species that I originally included in sect. *Adenosepalum* (Robson, 1977*b*) do not belong there. The putative 'linking' species, the Himalayan *H. elodeoides* Choisy, is in fact closely related to *H. hengshanense* W.T. Wang, from SE China (Jiangsi, Hunan, Guangxi, Guangdong). Indeed, Li (1990: 6) brought these two species together in his key to Chinese *Hypericum*, placing both in sect. *Adenosepalum*.

Three glabrous, western Asiatic species allocated to sect. *Adenosepalum* in Part 1 and previously in *Flora of Turkey* (Robson, 1967*b*) must also be excluded and transferred to sect. 12. *Origanifolia*. These are *H. huber-morathii* N. Robson, *H. minutum* Poulter and *H. formosissimum* Takht. They were originally excluded from sect. *Origanifolia* because their capsules lacked the swollen vesicles characteristic of *H. origanifolium* Willd. and *H. aviculariifolium* Jaub. & Spach. *H. minutum* and *H. formosissimum*, however, have interrupted vittae, which are also found in *H. imbricatum* Poulter and *H. salsugineum* N. Robson & Hub.-Mor., both clearly related to *H. aviculariifolium*; and *H. minutum* is clearly closely related to *H. huber-morathii*. When other characters, such as glandularity, leaf and flower colour and habitat (all in limestone rock crevices), are taken into consideration, there can be little doubt that their correct position is near *H. aviculariifolium*.

With the tropical and east Asiatic and Anatolian species excluded, sect. *Adenosepalum* can be seen to have its primitive, shrubby species in Macaronesia and three derivative groups: (i) African, wholly glabrous; (ii) NW Africa and the Canary Islands to (a) Somaliland and western Arabia and (b) the western Mediterranean, wholly with indumentum; (iii) Europe to western Caucasus and adjacent Turkey, the Mediterranean and Ethiopia (with adjacent NE Sudan and Arabia) to northern Tanzania, nearly always with indumentum. *H. elodes* L. (sect. 28. *Elodes*) is derived from group (ii) and *H. afrum* Lam. (from Tunisia and adjacent Algeria) fits well into group (i) rather than in sect. 9. *Hypericum*, where I originally located it (Robson, 1977*a*).

Sect. 20. *Myriandra*

Subdivision

This well-delimited section comprises 29 species and 4 subspecies that are mostly shrubs or wiry shrublets but include a few perennial

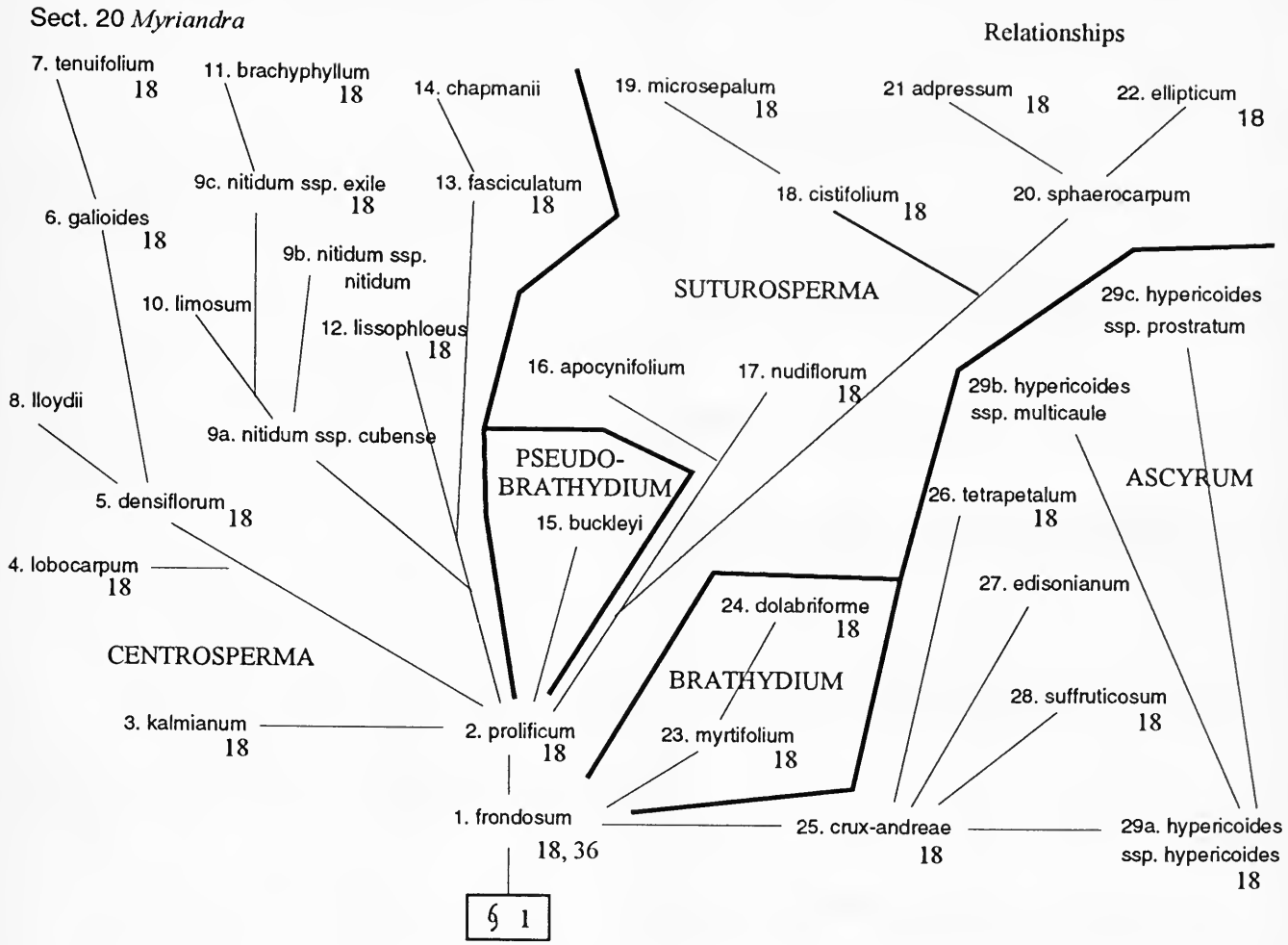


Fig. 1 Sect. 20. *Myriandra*. Relationships and chromosome numbers (2n) of the 29 species. Limits of the 5 (named) subsections indicated by bold lines.

herbs. They all lack black glands and have stamen fascicles closely merged, so that the androecium appears to be polyandrous and (in contrast to sect. 30. *Trigynobrathys*) remains so even in the smallest flowers. The styles are slender and closely mutually appressed in the more primitive species; but they have a tendency to part in fruit in more advanced 4-petalled ones ('*Ascyrum*'). The stigmas are small.

Keller (1893, 1925) divided the group treated here as sect. *Myriandra* into three main subgroups, viz. *Ascyrum* and two sections of *Hypericum*, with each section of *Hypericum* containing two subsections:

Ascyrum – sepals and petals 4; placentation parietal; styles 2–3(4).
Hypericum – sepals and petals 5; placentation axile to parietal.
Sect. *Myriandra* – stamens deciduous; placentation axile to parietal; styles 3–5.
Subsect. *Centrosperma* – placentation axile, pyramidal.
Subsect. *Suturosperma* – placentation parietal.
Sect. *Brathydium* – stamens persistent; placentation parietal or rarely axile; styles 3.
Subsect. *Eubrathydium* – placentation parietal.
Subsect. *Pseudobrathydium* – placentation axile, pyramidal.

Following the inclusion of the American species of *Ascyrum* in sect. *Myriandra* (Adams & Robson, 1961), Adams (1962) recognized only one section, subdividing it into two subsections:

Subsect. *Centrosperma* – shrubs; leaves and sepals with articulation or groove at base; sepals 5(4), deciduous; petals 5(4); stamens deciduous. 15 species, i.e. Spp. 1–14 in the present treatment + 23. *H. myrtifolium*.
Subsect. *Pseudobrathydium* – shrubs and perennial herbs; leaves and sepals without articulation or groove at base; sepals 5–4, persistent (deciduous in *H. nudiflorum*); petals 5–4; stamens persistent (except in *H. nudiflorum* and *H. apocynifolium*). 14 species, i.e. Spp. 15–22, 24–29 in the present treatment.

From these attempts at infrasectional division it would appear that there are three major groups (as Keller proposed), but that four species (*H. buckleyi*, *H. nudiflorum*, *H. apocynifolium* and *H. myrtifolium*) fall awkwardly across the proposed group divisions. In addition, the *Ascyrum* group is heterogeneous, as Spach (1836*b*) had already realized. Most species have two unequal pairs of broad appressed sepals, but in 19. *H. microsepalum* they are equal, narrow and recurved. Spach placed the latter in a monotypic genus, *Isophyllum*, as *I. drummondii*; and it is clearly not related to the other 4-petalled species but to 18. *H. cistifolium*, from which it appears to have been derived.

The suggested interrelationships of species in sect. *Myriandra* are shown in Fig. 1, along with the five subsections into which they have been divided here. It will be seen that there are two basal species (1.

H. frondosum and 2. *H. prolificum*, both variable, especially the latter), from which the remaining species have been derived. *H. frondosum* is directly related to the *Ascyrum* group (Spp. 25–29) and the *Brathydium* group (Spp. 23–24), whereas the *Suturosperma* group (Spp. 16–22) and *H. buckleyi* (Sp. 15) are directly related to *H. prolificum* (as are Spp. 3–14).

From Fig. 2, which shows the limits of certain characters, it will be clear why Keller and Adams had difficulty in defining their subdivisions and why no hard and fast lines can be drawn between *Myriandra* sensu stricto (Spp. 1–14) and the remaining species. The groups outlined above, however, can be treated as five reasonably well defined subsections:

1. Subsect. *Centrosperma* (p. 94) – Sepals and petals 5; sepals and stamens deciduous; leaves and sepals articulated; sepals very unequal to subequal; styles (2)3–5(6); placentation incompletely axile to parietal; shrubs. Spp. 1–14.
2. Subsect. *Pseudobrathydium* (p. 112) – Sepals and petals 5; sepals and stamens persistent; leaves and sepals not articulated; sepals subequal; styles 3; placentation incompletely axile; low shrub. Sp. 15.
3. Subsect. *Suturosperma* (p. 113) – Sepals and petals 5(4–3); sepals and stamens deciduous or persistent; leaves and sepals not articulated, sepals unequal or usually subequal; styles 3(4); placentation incompletely axile to parietal; shrubs or perennial herbs. Spp. 16–22.
4. Subsect. *Brathydium* (p. 122) – Sepals and petals 5; sepals persistent, stamens deciduous or persistent; leaves articulated incompletely or not at all, sepals not articulated; sepals very unequal to subequal; styles 3(4); placentation incompletely axile to parietal; shrubs or subshrubs. Spp. 23–24 (This subsection can be distinguished from the preceding one by the unequal *and* persistent sepals, more numerous stamens and widely branched inflorescence, see key p. 93).
5. Subsect. *Ascyrum* (p. 124) – Sepals and petals 4: sepals and stamens persistent; leaves articulated or not, sepals not articulated; sepals very unequal; styles 2–3(4); placentation parietal; shrubs or wiry shrublets. Spp. 25–29.

Characters and variation (Fig. 2)

The species in sect. *Myriandra* vary from bushy shrubs up to 3 m tall (1. *H. frondosum*) to minute prostrate mat-forming wiry herbs (29c. *H. hypericoides* subsp. *prostratum*). As mentioned above they lack black glands, and the pellucid glands are always punctiform. The contraction of the androecium to apparent polyandry is accompanied by trends towards a reduction in number of members of the floral whorls.

LEAVES. The most closely related species to sect. *Myriandra* in sect. 1. *Campylosporus* is the north-east African *H. synstylum*, which has pinnate leaf venation. Thus the venation in sect. *Myriandra* is also basically pinnate. In the primitive, broad-leaved species (e.g. 1. *H. frondosum*) the tertiary reticulation is very dense and clear, but it is less clear or obscure in species with thicker leaves (e.g. 18. *H. cistifolium*). The more advanced species in subsect. *Centrosperma* have linear, often needle-like leaves with only a midrib visible beneath.

The occurrence of a groove where the leaf joins the stem ('leaves articulated') is a plesiomorphic character in *Hypericum* in general and in sect. *Myriandra* in particular (Fig. 2). It is constant in subsect. *Centrosperma* and present in primitive members of subsects *Suturosperma* (Spp. 16, 17), *Brathydium* (23. *H. myrtifolium*) and *Ascyrum* (Spp. 25, 26) but is wholly absent from subsect. *Pseudobrathydium* (15. *H. buckleyi*). This character change is associated with a tendency for the point of leaf-fall to move from the basal groove to the petiole or pseudopetiole. Delayed basal leaf-fall is found in 16. *H. apocynifolium*, 17. *H. nudiflorum*, 25. *H. crux-andreae* and 26. *H. tetrapetalum*, while suprabasal leaf-fall occurs in 15. *H. buckleyi*, 18. *H. cistifolium*, 19. *H. microsepalum* and the remainder of subsect. *Ascyrum* (Spp. 27–29).

In the linear- to acicular-leaved species, there is a contrast between those in which the margin is revolute but the rest of the lamina unaltered (12. *H. lissophloeus* and the *H. galioides* and *H. nitidum* groups, Spp. 6–11) and the *H. fasciculatum* group (Spp. 13, 14), in which the midrib area is raised beneath, forming a groove on each side between it and the revolute margin (cf. Fig. 2).

INFLORESCENCE. The inflorescence of the near-ancestral *H. synstylum* is 1–2-flowered, a state that is reflected in the 1–3-flowered basic inflorescence of sect. *Myriandra* (usual in 1. *H. frondosum*). Two evolutionary tendencies lead to (i) the involvement of an increasing number of nodes in flower-bearing (basipetal) and (ii) an increasing degree of cymose (i.e. dichasial/monochasial) branching (acropetal). Basipetal branching is dominant in subsect. *Centrosperma*, leading to the long narrow inflorescences of *H. galioides*, *H. nitidum*, *H. lissophloeus* and their relatives. Acropetal branching is dominant in subsects *Suturosperma*, *Brathydium* and *Ascyrum*, where involvement of more than three nodes is rare, occurring only in forms of 25. *H. crux-andreae* and 29. *H. hypericoides*. Pseudo-dichotomous branching is confined to subsect. *Ascyrum*, where it occurs wholly or partly in all species.

FLOWERS AND FRUITS. References have been made above to the evolutionary reduction in number of floral members in sect. *Myriandra*. The polyphyletic reduction from pentamery to tetramery in the perianth is associated in subsect. *Ascyrum* with a reduction to a dimerous gynoecium. The gynoecium is otherwise regularly trimerous except in Spp. 2–5, where there appear to have been secondary increases to 4–5-mery, and occasionally in the *galioides*, *nitidum* and *fasciculatum* groups (Spp. 6–14).

The sepals are primitively unequal (e.g. in 1. *H. frondosum*) and remain markedly so in tetramerous forms of that species and in the directly related subsect. *Ascyrum*, where the outer pair is large and appressed (concealing the developing fruit) and the inner pair very small or even absent (in some forms of 28. *H. suffruticosum*). In the rest of the section except subsect. *Brathydium*, the inequality gradually becomes less, so that in the other species with a usually tetramerous perianth, 19. *H. microsepalum*, the sepals are almost equal. In subsect. *Brathydium* (Spp. 23, 24), however, both species have unequal sepals, although the inequality is less in 24. *H. dolabriforme* than in 23. *H. myrtifolium*. The curved-dolabriform (hammer-shaped) petals in the former are the most extreme in form in the section. Otherwise the petals do not provide specifically distinct characters. The trend from deciduous to persistent stamens has already been mentioned above, and the stamens otherwise vary only in number and length, decreasing from *c.* 650 of up to 12 mm long (1. *H. frondosum*) to *c.* 30 of 2.5–4 mm (28. *H. suffruticosum*). The relatively large number of stamens is one of the reasons for associating *H. dolabriforme* with *H. myrtifolium* rather than with 20. *H. sphaerocarpum*.

The ovary placentation is never truly axile, i.e. the placentae never meet in the middle of the ovary. The primitive state, incompletely axile or pseudo-axile, is found in Spp. 1–5 of subsect. *Centrosperma* and in subsect. *Pseudobrathydium* (Sp. 15) and 23. *H. myrtifolium*.

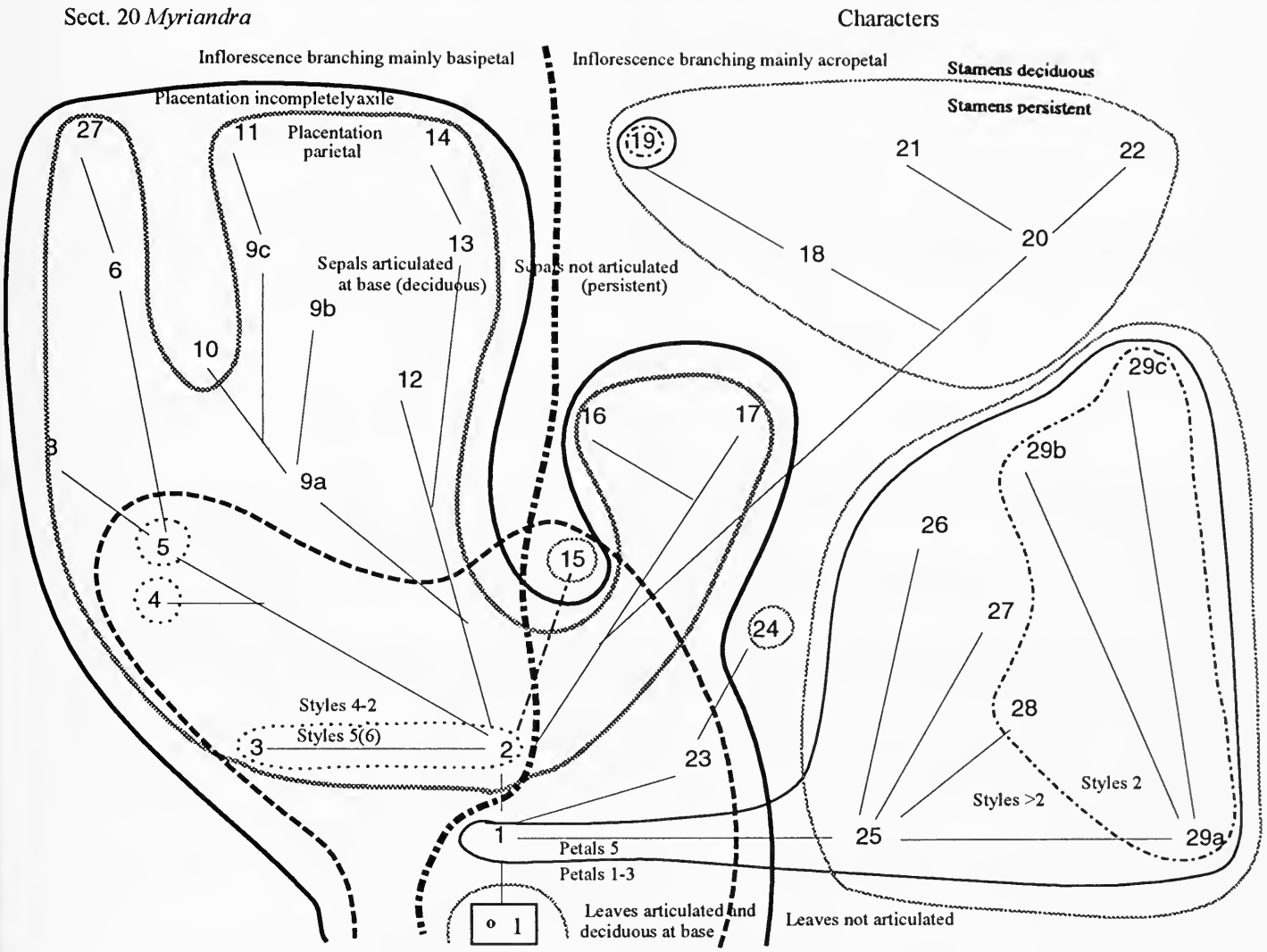


Fig. 2 Sect. 20. *Myriandra*. Limits of certain characters. Note the isolated apomorphic occurrences of 5(6)-styled and persistent stamens respectively.

Elsewhere there are parallel developments to truly parietal placentation in all subsections. The variation in testa pattern of the seeds is not so great as it is in some other sections: from reticulate to finely scalariform via scalariform-reticulate and linear-foveolate.

Cytology and hybrids (Fig. 1)

The chromosome number in sect. *Myriandra* is almost consistently n = 9, 2n = 18, except for a record of 2n = 16 for 22. *H. ellipticum*, a tetraploid record for 1. *H. frondosum* (p. 96) and a population of 5. *H. densiflorum* from Macon Co., North Carolina that had 2n = 27, n = 11–14 (Adams, 1959). Despite this relative uniformity of chromosome number, natural hybrids appear to be very rare except in cultivation, which suggests that the species are isolated by ecological and/or biological factors rather than by geographical separation alone. The cultivated hybrids, which arose spontaneously and doubtless continue to appear when suitable species are grown together, all involve Spp. 1–6 only.

Distribution and evolution (Fig. 3)

The north-east American and Caribbean sect. *Myriandra* is, as was noted in Part 3 (Robson, 1985: 169), most closely related to those species of sect. *Campylosporus* in which (i) the styles are completely united even in fruit and (ii) there are tendencies for the petals to fall tardily (*H. quartinianum*) and for the black glands to be completely absent (*H. synstylum*). In these species, too, the development of pinnate venation is almost complete, only the lowermost pair of lateral veins or one of them remaining free. *H. quartinianum* occurs from south-western Arabia (Yemen) to northern Malawi and northern Mozambique, whilst the relatively apomorphic *H. synstylum* is confined to two adjacent areas in eastern Ethiopia (Harar) and one in northern Somalia.

There is a wide distributional gap, therefore, between north-east Africa and south-eastern U.S.A., where 1. *H. frondosum*, the most primitive species in sect. *Myriandra*, occurs sporadically from Kentucky to Georgia and eastern Texas. There is a considerable morphological gap, too, as *H. frondosum* has deciduous petals and stamens, the stamen fascicles are completely united with a considerably increased number of stamens, and the ovary is 3-merous. In the leaves, the acute to obtuse apex of the African plants has become apiculate-obtuse to rounded, and the venation is wholly closed and pinnate, with widely spreading (not ascending) laterals, densely reticulate tertiary venation and punctate (not elongate) glands.

From *H. frondosum* three clades diverge (i, vii, viii), these corre-

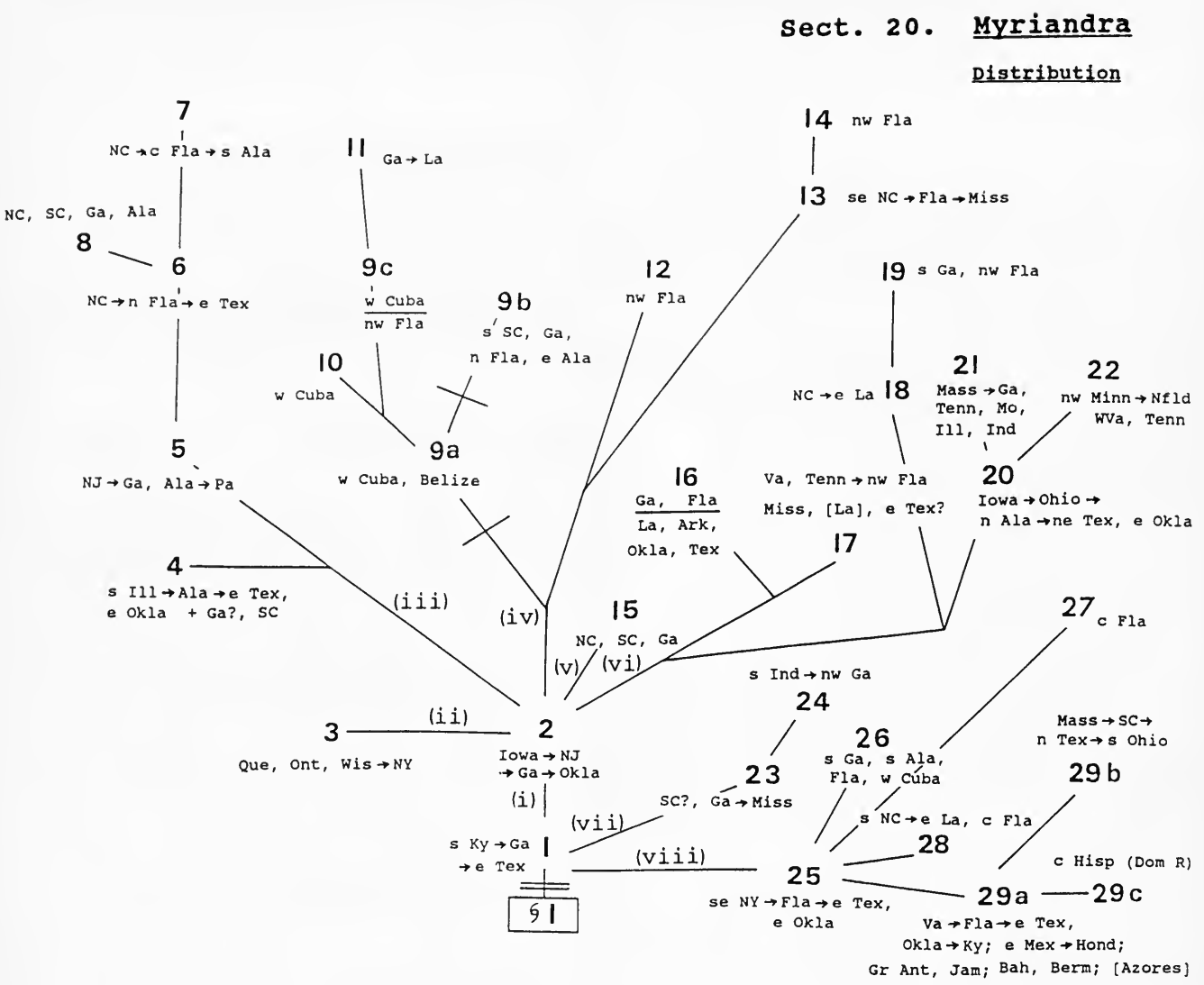


Fig. 3 Sect. 20. *Myriandra*. Distribution of the 29 species, showing major (==) and minor (—) disjunctions and trends (→). Lower case letters indicate compass points; square brackets indicate extinctions (Sp. 17) or introduction (Sp. 29c); roman figures indicate major clades (see text). Geographical abbreviations used in Fig. 3: Ala – Alabama, Ark – Arkansas, Bah – Bahamas, Berm – Bermuda, Dom R – Dominican Republic, Fla – Florida, Ga – Georgia, Gr Ant – Greater Antilles, Hond – Honduras Republic, Ill – Illinois, Ind – Indiana, Jam – Jamaica, Ky – Kentucky, La – Louisiana, Mass – Massachusetts, Mex – Mexico, Minn – Minnesota, Miss – Mississippi, Mo – Missouri, NC – North Carolina, Nfld – Newfoundland, NJ – New Jersey, NY – New York, Okla – Oklahoma, Ont – Ontario, Pa – Philadelphia, Que – Quebec, SC – South Carolina, Tenn – Tennessee, Tex – Texas, Va – Virginia, Wis – Wisconsin, W Va – West Virginia.

sponding to (i) *H. prolificum* and the rest of subsect. *Centrosperma* along with subsects *Pseudobrathydium* and *Suturosperma*, (vii) subsect. *Brathydium* and (viii) subsect. *Ascyrum*. The transition from 1. *H. frondosum* to 2. *H. prolificum* is gradual, consisting essentially of reductions in size of parts and increase of variation north-westward from NW Georgia to the uplands bordering the central Mississippi basin; but there is a morphological 'gap' between these species, at least in the wild. The wide distributional range of 2. *H. prolificum* includes a comparably wide range of variation, so that as many as five clades (ii–vi) appear to have arisen directly from it. 3. *H. kalmianum* (ii) is a northern derivative in which reductions in size (overall and of most parts) and inflorescence-branching are accompanied by a (secondary) increase to 5-mery in the ovary. The Great Lakes type of distribution may be associated with the glacial nunatak in this region, i.e. the species may have reached its present area in pre-glacial times. Utech & Iltis (1970), however, favour the hypothesis that *H. kalmianum* had a recent, post-glacial origin (from *H. prolificum*). The other single-species derivative (15. *H. buckleyi*) (v) has an area in the Carolinas and Georgia (the Blue Ridge Mountains) that is wholly within that of *H. prolificum*. The speciating factors for this dwarf straggling shrub with reductions in size and inflorescence-branching would seem to be altitude and exposure.

The remainder of subsect. *Centrosperma* (clades iii and iv) show several parallelisms, so that extreme members of each (7. *H. tenuifolium* and 8. *H. lloydii* on the one hand and 11. *H. brachyphyllum* on the other) have come to resemble one another, with resultant taxonomic confusion. Adams (1959, 1962) resolved this confusion as regards the U.S. species, and I have attempted to incorporate the taxa from Cuba and Belize. Clade (iii) is relatively straight-forward. A southward trend from *H. prolificum* resulted in two taxa, one north-eastern (5. *H. densiflorum*), the other south-western (4. *H. lobocarpum*). The reasons for treating these taxa as species rather

than subspecies are explained on p. 100. In both species there is a reduction in size of flower and leaf and an increase in flower number. In *H. lobocarpum*, these changes are accompanied by a marked tendency towards a 5-merous ovary and lobed fruit, whereas in *H. densiflorum* they are not. *H. lobocarpum* is mainly in the uplands to the west of the lower Mississippi; *H. densiflorum* has a two-armed distribution: coastal plain from New York to S. Carolina and along the western side of the Appalachian Mts. But an 'arm' of *H. lobocarpum*'s area extends eastward in the south to south-eastern S. Carolina; and where the southern end of the *H. densiflorum* area meets this 'arm', in central Alabama, some intermediates (hybrids?) occur. A narrow-leaved form of *H. densiflorum* found in Tennessee (*H. interior* Small) provides a morphological link to the narrower-leaved 6. *H. galioides*, which has a coastal-plain distribution (N. Carolina to eastern Texas excluding peninsular Florida). This species of relatively wet habitats is ecologically distinct from its largely co-extensive reduced derivative, 8. *H. tenuifolium*, a plant of dry sandy habitats. Between the 'arms' of *H. densiflorum*'s range there occurs 7. *H. lloydii*, a low, spreading, narrow-leaved derivative of that species from the eastern South Appalachian foothills. The remaining derivative clade of subsect. *Centrosperma* (iv) forms the *H. nitidum-H. fasciculatum* group, which comprises two subgroups: the *H. fasciculatum* group (Spp. 12–14), confined to the American lowland mainland from N. Carolina to Mississippi, and the *H. nitidum* group (Spp. 9–11), having a similar distribution but extending into Louisiana, western Cuba and Belize. The primitive forms of 9. *H. nitidum* would appear to be in Cuba and Belize, but those of 13. *H. fasciculatum* are in Florida. The overlapping areas and incomplete morphological differentiation of the taxa in the *H. nitidum* group suggest that land-connections between Belize and Florida via Cuba existed for a long time.

The remaining clade from 2. *H. prolificum* (Clade vi) comprises subsect. *Suturosperma*, of which the lowest branch (Spp. 16, 17) includes species that are morphologically somewhat intermediate. *H. apocynifolium* and *H. nudiflorum*, which have inflorescences that are more acropetally branched than those of *H. prolificum* as well as smaller flowers and broader leaves, form another east-west pair with overlapping distributions: *H. apocynifolium* from Oklahoma and Texas to Louisiana with outliers on the Florida–Georgia border, *H. nudiflorum* from eastern Texas to Virginia excluding Louisiana,

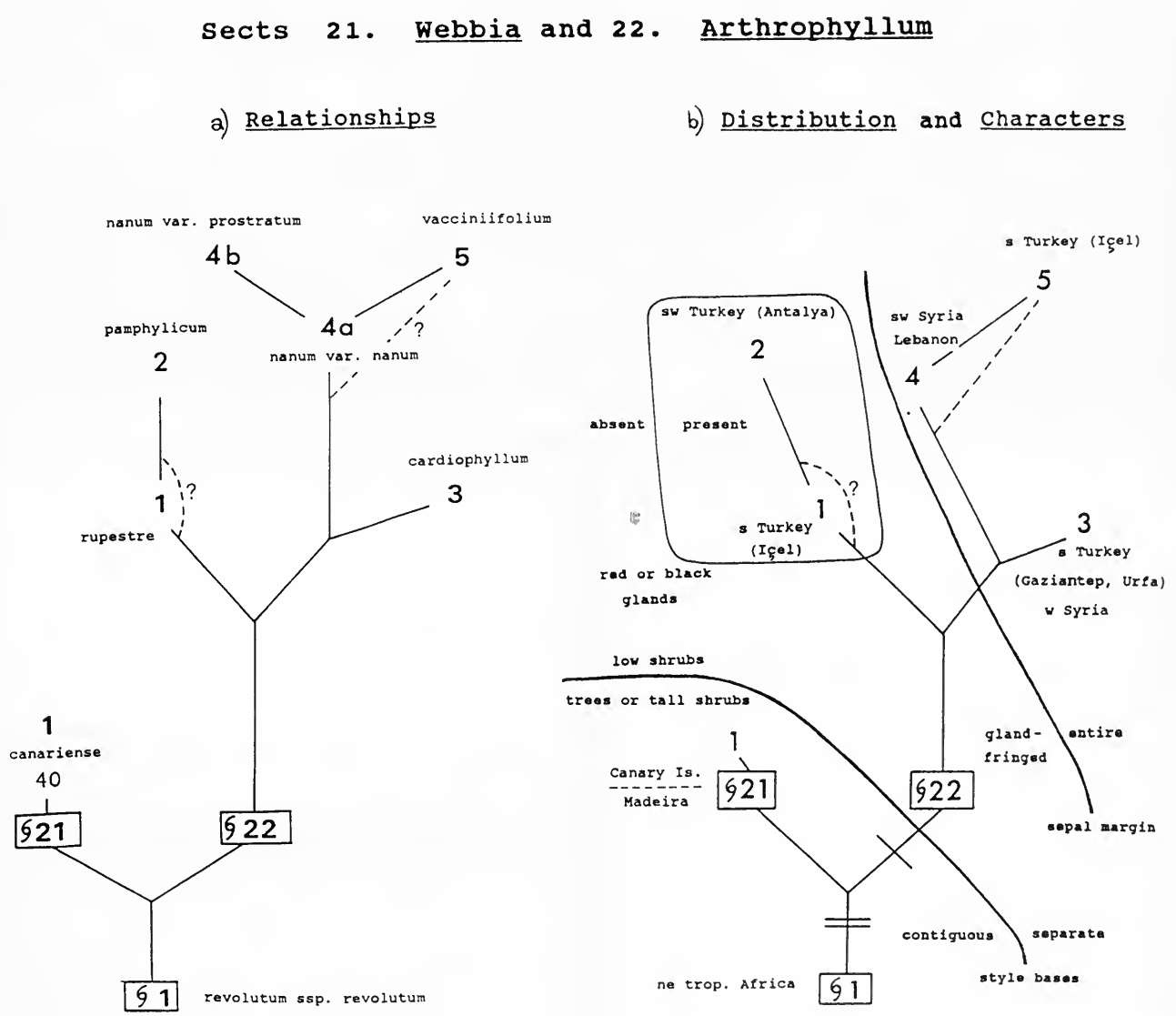


Fig. 4 Sects 21. *Webbia* and 22. *Arthrophyllum*. a) Relationships and chromosome number (2n). b) Distribution and limits of certain characters. For key to annotations see Fig. 3 (p. 80).

Sects 23. Triadenioides, 24. Heterophylla, 25. Adenotrias

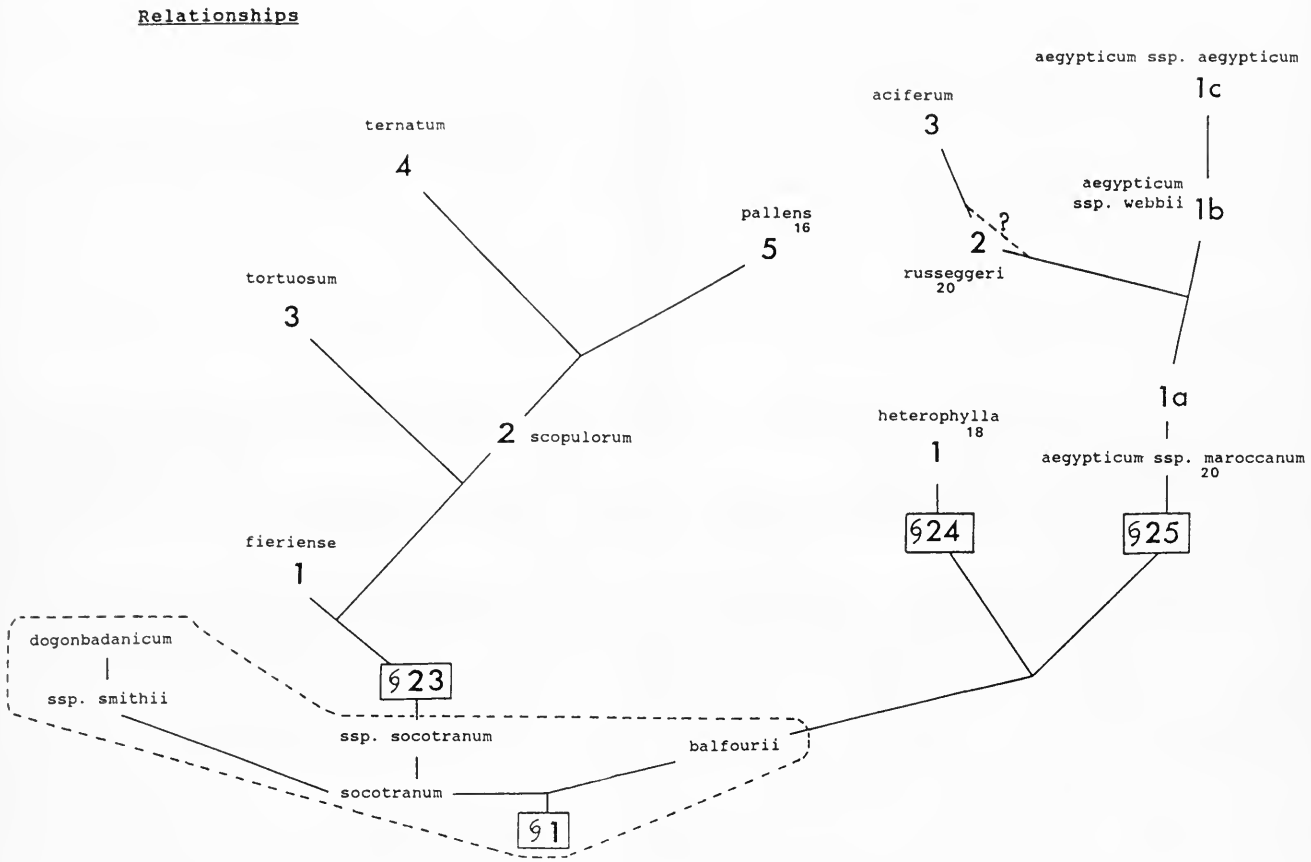


Fig. 5 Sects 23. *Triadenioides*, 24. *Heterophylla* and 25. *Adenotrias*. Relationships within sections and with species of sect. 1 *Campylosporus*, showing chromosome numbers (2n).

where it is apparently extinct. The rest of the clade consists of a southern branch (18. *H. cistifolium* in the Coastal Plain from N. Carolina to Louisiana including Florida, 19. *H. microsepalum* in Florida) and a northern one (20. *H. sphaerocarpum* in the central and upper Mississippi valley 'giving rise to' the herbaceous 21. *H. adpressum* (north-eastern) and 22. *H. ellipticum* (northern).

To return to the clades directly related to 1. *H. frondosum*, in subsect. *Brathydium* 23. *H. myrtifolium* (Clade vii) has smaller but broad leaves and a more acropetally developed, more widely branching inflorescence than *H. frondosum*, and its distribution (Georgia to Mississippi) is to the south-east and distinct. The derivative 24. *H. dolabriforme*, with narrower leaves and more unequal sepals, has a small relict area to the north-west centred in Kentucky and Tennessee. Finally, in Clade viii (subsect. *Ascyrum*) the variable *H. crux-andreae* occupies a wide area southward of a line from south-eastern Oklahoma to New York (Long Island). Three of the derivative species occur wholly (27. *H. edisonianum*, 28. *H. suffruticosum*) or largely (26. *H. tetrapetalum*) within that area, *H. tetrapetalum* being found also in western Cuba. The very variable 29. *H. hypericoides*, however, has a much wider distribution and is divided into three subspecies. The subspecies morphologically nearest to *H. crux-andreae*, 29a. subsp. *hypericoides*, occupies almost the same region in the U.S.A. as that species (Delaware and Maryland west to eastern Oklahoma and eastern Texas), but it also occurs disjunctly along the Eastern Cordillera in Mexico, Guatemala and the Honduras Republic. In addition, it is found in the main islands of the Greater Antilles and in the Bahamas and Bermuda. A record from the Azores suggest that it is a relatively recent arrival there; but whether it came by natural extension of range or with human assistance is not clear. Overlapping the northern margin of the range of the erect 29a. subsp. *hypericoides* is that of the more spreading 29b. subsp. *multicaule* (Oklahoma to Massachusetts); and in Hispaniola (Dominican Republic) there is a prostrate, almost herbaceous form (29c. subsp. *prostratum*).

Sects 21. *Webbia* and 22. *Arthrophyllum*

Characters and variation (Fig. 4a, b)

Sects *Webbia* and *Arthrophyllum* form a monophyletic group directly related to sect. *Campylosporus*. As will be explained on p. 135, I now regard the nearest relative of *H. canariense* (sect. *Webbia*) to be not *H. roeperianum* (as in Robson, 1985: 166–168, ff. 1–3) but *H. revolutum* subsp. *revolutum*, more specifically the relatively broad-leaved form of that species that occurs sporadically in Ethiopia. From it, *H. canariense* differs *inter alia* in having '3' stamen fascicles, a 3-merous ovary with divergent styles, no black glands,

Sects 23. Triadenioides, 24. Heterophylla, 25. Adenotrias

Characters

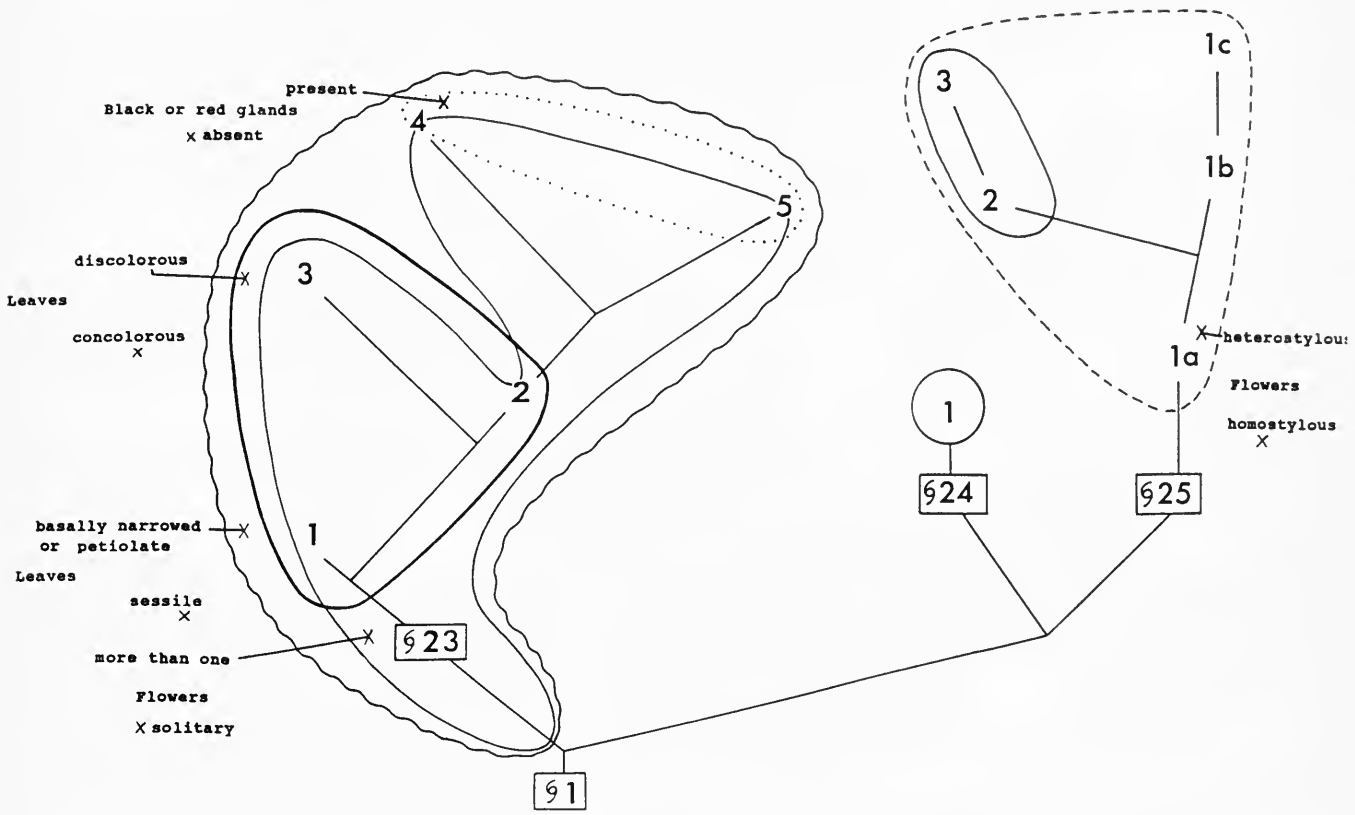


Fig. 6 Sects 23. *Triadenioides*, 24. *Heterophylla* and 25. *Adenotrias*. Limits of certain characters.

and leaves with densely reticulate tertiary venation. In addition, the bark is smooth and usually whitish grey, a character that links it to the species of sect. 22. Indeed, apart from a difference in habit (trees or ± erect shrubs up to 4 m versus low, compact and rounded to prostrate shrubs up to *c.* 0.9 m), the only essential differences between these sections would appear to be in the style bases (contiguous then divergent v. separate) and testa sculpturing (linear-foveolate v. minutely rugulose).

Within sect. *Arthrophyllum* there is a return to the presence of hypericin-containing glands in 1. *H. rupestre* and 2. *H. pamphylicum*, black in 1 and red in 2, although in all other respects *H. pamphylicum* is more advanced than *H. rupestre*, e.g. in its perfoliate leaves. In the other branch of Fig. 4 there is, as well as a reduction in overall size and in size of parts, a change from cordate to cuneate leaf-base.

Distribution and evolution (Fig. 4b)

Sects *Webbia* and *Arthrophyllum*, though morphologically similar, are geographically divergent. *H. canariense* is confined to the Canary Islands (except the drier eastern ones) and Madeira, thus being separated from its apparent nearest ancestral relatives in Ethiopia by the width of Africa. It is separated by the length of the Mediterranean from sect. *Arthrophyllum*, which has an interrupted distribution from Vilayet Antalya in south-west Turkey to the mountains on the Lebanon–Syria border. The facts that (i) the five species in this section are so morphologically and geographically disparate and that (ii) each occupies a restricted area suggest that it is a relatively ancient group that evolved (or at least diverged) in Tertiary times; and the link with Macaronesia further associates it with the pan-Mediterranean flora of that epoch.

Sects 23. *Triadenioides*, 24. *Heterophylla* and 25. *Adenotrias*

Characters and variation (Figs 5, 6)

Sects 23–25 all derive from the *H. socotranum* group of sect. *Campylosporus*, sect. 23. *Triadenioides* having a Socotra–E. Mediterranean distribution and sects 24. *Heterophylla* and 25. *Adenotrias* (as a group) an Atlantic–Mediterranean one.

Sect. *Triadenioides* is most closely related to *H. socotranum* subsp. *socotranum*, and its species either share with that taxon a narrowing of the leaf-base (2. *H. scopulorum* in part) or have a petiole. The leaf venation is simply pinnate, a state which can be derived from that of subsp. *socotranum* by elimination of the 1–2 pairs of basal veins and expansion of the (closed) midrib branching to occupy the whole lamina. The flowers in sect. 23 are much reduced in size from those of subsp. *socotranum*, and trimery (ovary) and pseudotrimery (stamens) have developed. The three more primitive (Socotran) species have discolorous leaves; but in the

Sects 23. Triadenioides, 24. Heterophylla, 25. Adenotrias

Distribution

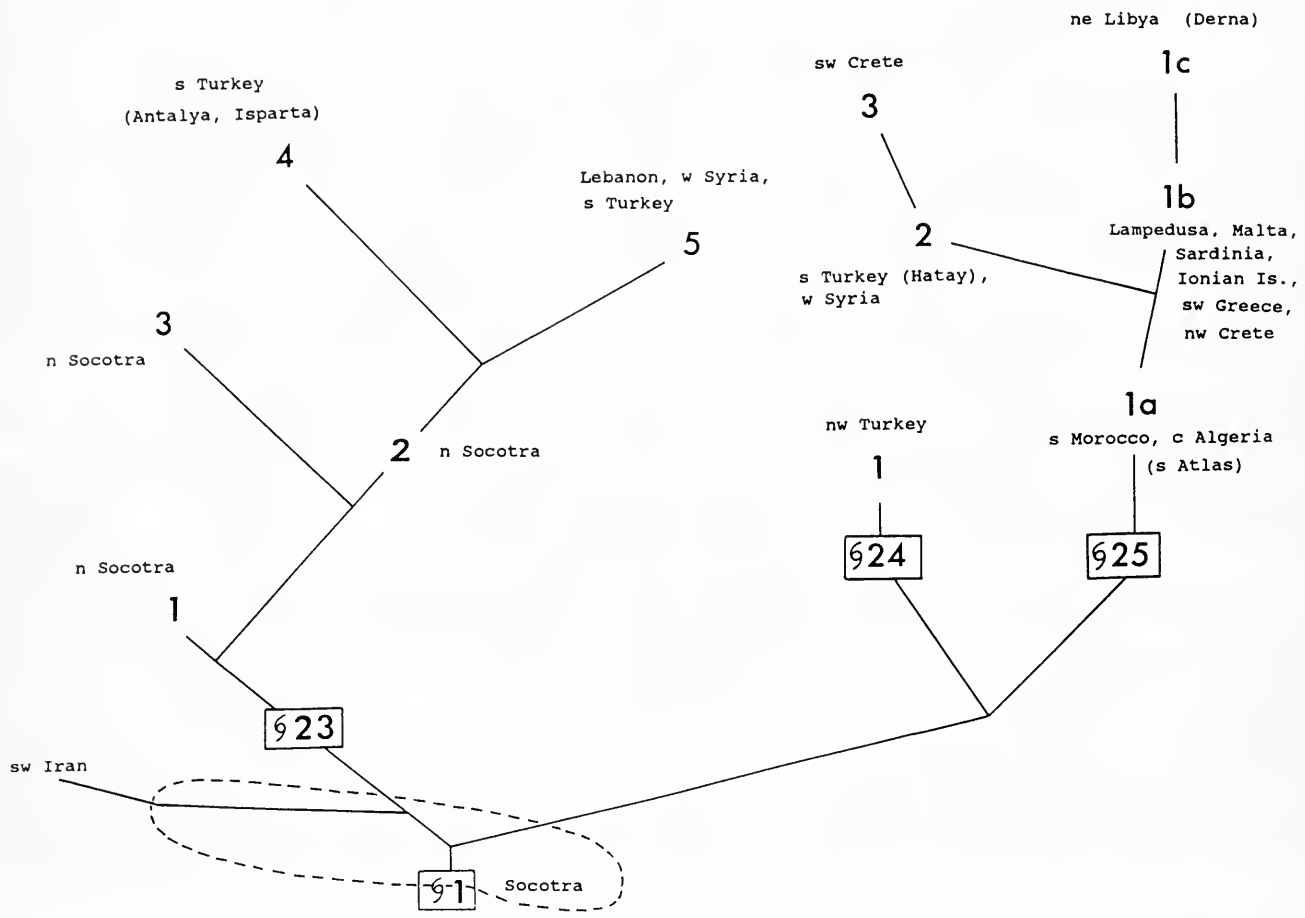


Fig. 7 Sects 23. *Triadenioides*, 24. *Heterophylla* and 25. *Adenotrias*. Distribution of the species and of the immediately related species in sect. 1 *Campylosporus*. *H. tortuosum* (Sect. 23, Sp. 3) also occurs in western Socotra (Map 21).

Mediterranean 4. *H. ternatum* and 5. *H. pallens* both sides of the leaf are glaucous, and in the former the leaves are 3-whorled. There is a multiplication of flowers in the inflorescence in both groups, but red or black glands are found only in the Mediterranean group.

The essential distinction between sects 24. *Heterophylla* and 25. *Adenotrias* is the presence in the latter of specialized pollination and dispersal adaptations (see opposite and p. 150; also Robson 1972, 1981; Reynaud, 1985).

Distribution and evolution (Fig. 7)

Although there is a considerable morphological gap (especially florally) between the large-flowered Socotran species of sect. 1 (*H. balfourii* and *H. socotranum*) and all three derivative sections, the respective geographical disjunctions are very different. Whereas three disjunct but closely related species of sect. 23. *Triadenioides* occur in one mountain range in Socotra (1. *H. fieriense*, 2. *H. scopulorum*, 3. *H. tortuosum*, 1 and 2 being both endemic to it and directly related to *H. socotranum*), there is then a morphological and geographical gap in this section between them and the more highly evolved 4. *H. ternatum* and 5. *H. pallens* in the north-east Mediterranean. On the other hand, the main morphological and evolutionary gaps in the other evolutionary line are between northern Socotra (*H. balfourii*) and respectively north-west Anatolia (*H. heterophyllum*, sect. 24. *Heterophylla*) and southern Morocco (the largest form of the heterostyled *H. aegypticum*, 1a. subsp. *maroccanum*, sect. 25. *Adenotrias*). *H. heterophyllum* is more advanced than *H. aegypticum* in several characters (e.g. (i) elongate upper stem-internodes and condensed lower stem-internodes, resulting in gemma-like axillary buds; (ii) a several-flowered inflorescence; (iii) a chromosome number of n = 9, not 10); but it lacks the floral features by which the species in sect. *Adenotrias* are adapted for specialized insect pollination (heterostyly, etc.) and the carunculate seeds that aid them in dispersal. *H. heterophyllum* is therefore most likely to have been derived from a precursor of sect. *Adenotrias*, one in which the specializations had not developed.[1] The divergence of sects 24 and 25 can thus be seen as an east-west split in the Mediterranean region.

Within sect. 25 there is a very disjunct reduction trend in 1. *H. aegypticum* from south Morocco along the southern slopes of the

[1] I am grateful to Chris Humphries for doing a cladistic analysis of sects *Heterophylla* and *Adenotrias* that supported this conclusion.

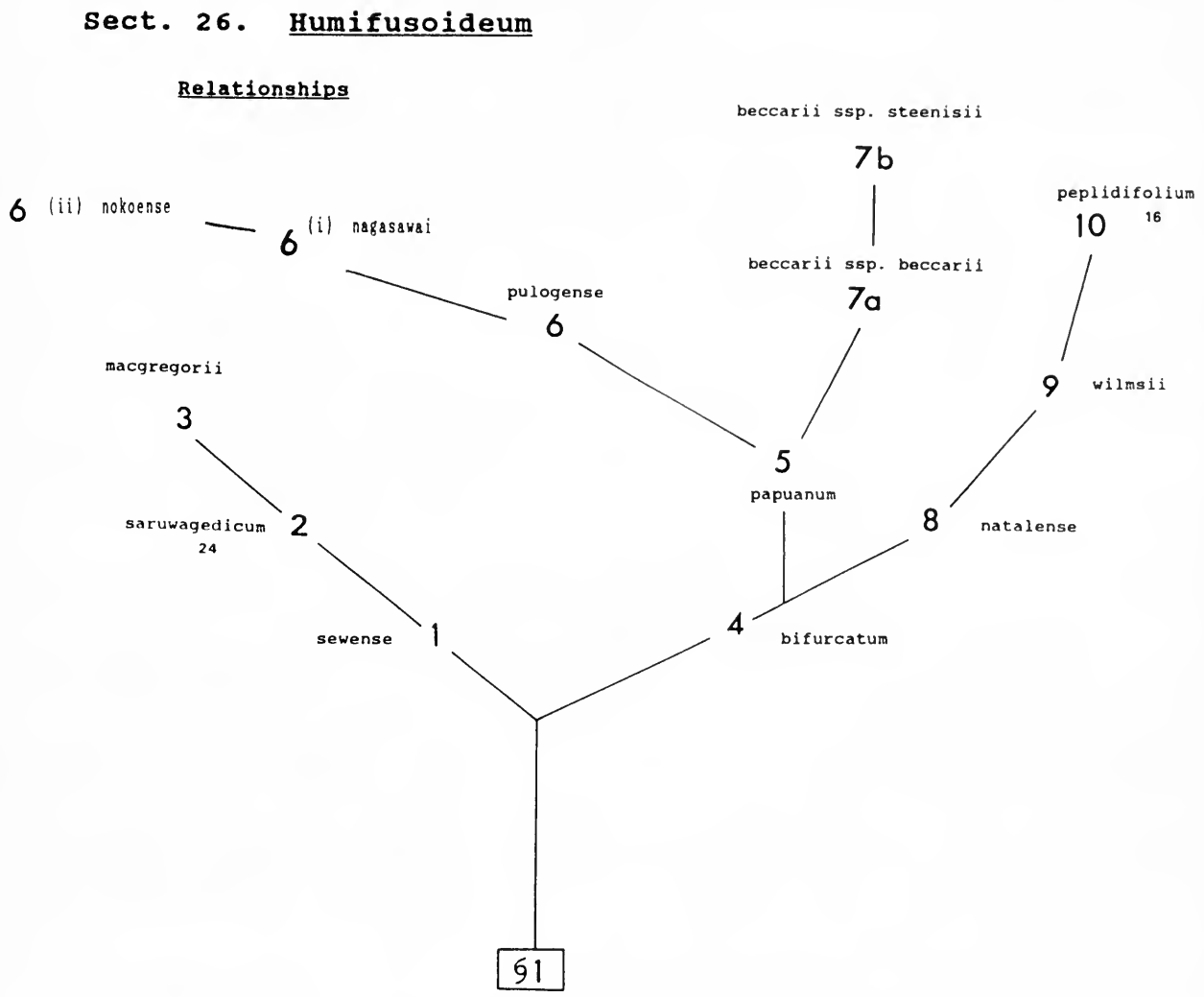


Fig. 8 Sect. 26. *Humifusoideum*. Relationships and chromosome numbers (2n) of the 10 species. 6(i) *H. nagasawai* has 2n=36 (not shown).

Atlas Mts in Algeria to Lampedusa, the Maltese Islands and one mountain in Sardinia. There is then a 'jump' to the Ionian Islands, a small area in the western Peloponnisos and another in north-west Crete, then another disjunction to the Derna area of Libya. The tall erect long-leaved Moroccan plant gradually becomes small, decumbent to prostrate (in Crete) and short-lived, so that the two ends of the morphocline look very different. It is, however, almost continuous, so that no populations merit more than subspecific rank, and even that rank may sometimes prove difficult to justify. There is a bigger morphological and geographical disjunction from western Greece to the northern Levantine 2. *H. russeggeri*, a species with leaves broader above (not at or below) the middle and pedunculate several-flowered inflorescences that was once also found in north-west Turkey. The morphocline from this species then turns westward to south-western Crete, where 3. *H. aciferum* resembles a smaller prostrate-branched version of *H. russeggeri*.

With the possible exception of the Sardinian localities of *H. aegypticum* subsp. *webbii*, all regions of the Mediterranean occupied by members of sect. *Adenotrias* are strongly influenced by maritime conditions; the plants typically grow among maritime limestone rocks. How then are we to explain the distribution of *H. aegypticum* subsp. *maroccanum* along the southern edge of the Atlas ranges, facing the Sahara desert? There is apparently no evidence of an ancient ocean in that area. Indeed, the traditional course of the Tethys Sea (and hence of the boundary between Gondwanaland and the northern supercontinent, Laurasia) is through the Strait of Gibraltar. If this boundary were to have taken a more southerly course, so that the Atlas Massif 'belonged' to Laurasia, not to Gondwanaland (as was proposed by e.g. Melville, 1967: 294), then the south face of the Atlas Massif would indeed be part of the northern shore of the Tethys Sea, and *H. aegypticum* would at one time have been growing in typical maritime conditions.

As regards the Sardinian localities of *H. aegypticum*, these comprise several isolated sites where the species forms part of 'an archaic relict flora no longer in balance with the present Mediterranean macroclimate' and has presumably originated 'from the lands of the Tertiary Tyrrhenian-Iberian-Riffian continent' (Arrigoni, 1965).

Sect. 26. *Humifusoideum*

Characters and variation (Figs 8, 9)

Despite the long distance between the locality of the most primitive species in sect. *Humifusoideum* (NE New Guinea) and those of its nearest relatives in sect. *Campylosporus* (*H. lanceolatum* in Réunion and *H. madagascariense* in Madagascar), the morphological gap is

Sect. 26. Humifusoideum

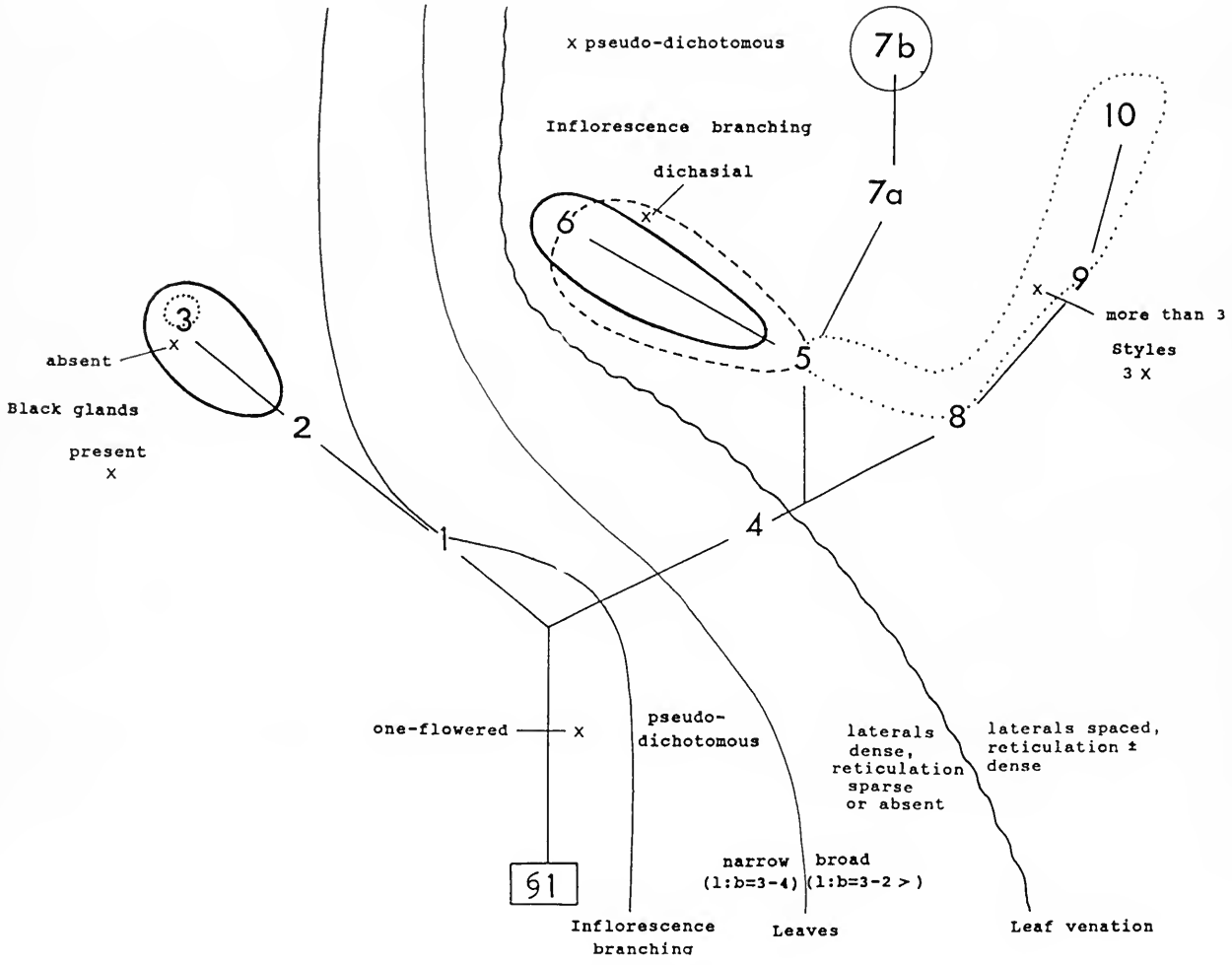


Fig. 9 Sect. 26. *Humifusoideum*. Limits of certain characters. Note (i) the isolated apomorphic occurrences of more than 3 styles and the absence of black glands and (ii) the development of pseudo-dichotomous and then (in Sp. 6) dichasial inflorescence-branching. Spp. 6(i) in part and 6(ii) also have dichasial inflorescence branching, and both have black glands (not shown).

not so very great. *H. sewense* has an overall resemblance to the latter, but it is smaller in stature and has three spreading styles (not five appressed ones). Its venation of closely parallel lateral veins sometimes flanked by rows of streaks or dots is reminiscent of that of *H. lanceolatum* subsp. *angustifolium*, and the similar more numerous veins in the broader leaves of *H. bifurcatum* are even more reminiscent of leaf-venation in that taxon. In the species with broader leaves (Spp. 5–7a, 8–10) the laterals are more widely spaced with evident tertiary reticulation, and in the secondarily narrow leaves of 7b. *H. beccarii* subsp. *steenisii* and some forms of 6(i). *H. nagasawai* there are remnants of this reticulation.

The occurrence of black glands is variable in sect. *Humifusoideum*, but they are always present somewhere in the plant (on the anthers and/or the margins of leaves, sepals and/or petals) except in (i) 3. *H. macgregorii* and (ii) 6. *H. pulogense* and a few populations of its nearest ancestral relative, 5. *H. papuanum*. Absence of black glands is thus apomorphic in this section. When present they are never laminar, except sometimes in the petals of 6(i). *H. nagasawai*, 6(ii). *H. nokoense* and 7a. *H. beccarii* subsp. *beccarii*. Another reversal in normal trend direction is in style number. Spp. 1–4 all regularly have a 3-merous ovary, but in 5. *H. papuanum* the ovary varies from 3-mery to 5-mery and even exceptionally 6-mery (Smith, 1941); and in 6. *H. pulogense* it is occasionally 4-merous. There is a parallel trend among the African species: 3–4(–5)-merous in 8. *H. natalense*, 3–4-merous in 9. *H. wilmsii* and (4–)5-merous in 10. *H. peplidifolium*. The fascicles of stamens are more or less obscure throughout the section, but the increased number of styles is apparently accompanied by a 'return' from '3' (i.e. 2+2+1) fascicles to 5 vaguely distinct ones (Saunders, 1937). Keller's (1893, 1925) classification of *H. peplidifolium* in a separate monotypic section because of its alleged

Sect. 26. Humifusoideum

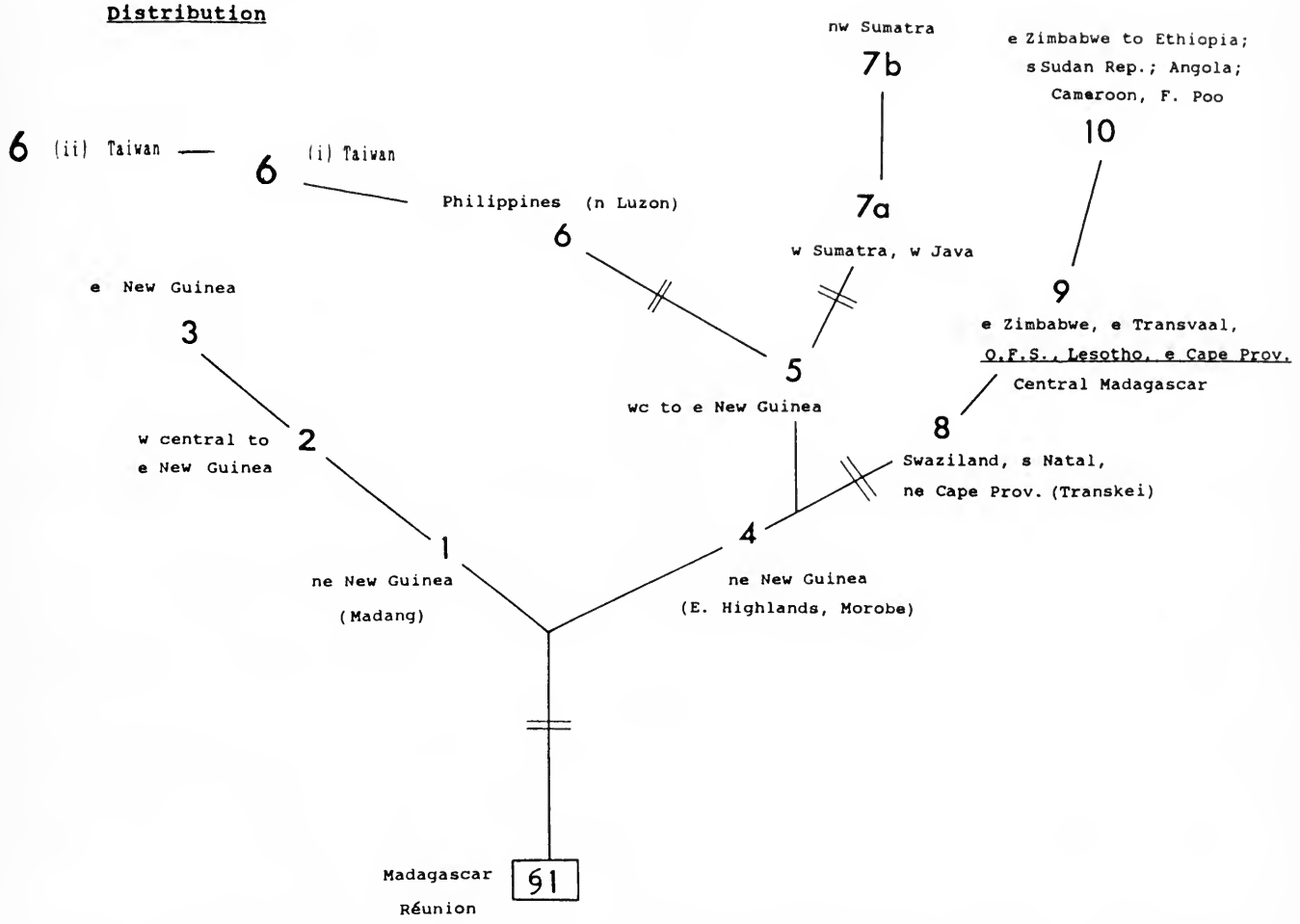


Fig. 10 Sect. 26. *Humifusoideum*. Distribution of the 12 species and the immediately related species in sect. 1 *Campylosporus*. For key to annotations see Fig. 3 (p. 80). The gap in distribution between Sp. 6 (Luzon) and Spp. 6(i) and 6(ii) (Taiwan) constitutes a further small disjunction.

possession of '3' stamen fascicles and 5 styles does not appear to be warranted.

Inflorescence branching is also variable in sect. *Humifusoideum*. In 1. *H. sewense*, as in the primitive species of sect. *Campylosporus*, the flowers are nearly always solitary, terminating lateral branches. In the only collection known so far, however, there are one or two examples of pseudo-dichotomous branching. In the derivative narrow-leaved species (Spp. 2–3), branching is wholly lateral, but in 4. *H. bifurcatum* it is wholly pseudo-dichotomous. This type or the derived 'pseudo-axillary' branching (see Sp. 10) is constant in the rest of the section except in 5. *H. papuanum*, 6. *H. pulogense*, 6(i). *H. nagasawai* and 6(ii). *H. nokoense*, where the solitary flower is sometimes replaced by a regular dichasium or (Sp. 6) mixed dichasial/pseudo-dichotomous branching.

Distribution and evolution (Fig. 10)

The extraordinary distribution and a consequent theory of evolution of sect. *Humifusoideum* were discussed in Part 2 (Robson, 1981: 212), so only a modified summary will be given here. The morphological and geographical relations between 1. *H. sewense* and the Mascarene species of sect. *Campylosporus* imply that the ancestors of sect. *Humifusoideum* spread to Australia (probably via Antarctica) before the final separation of the African and Australian land-blocks, about 140 m.y. B.P. When the Australian plate (which includes New Guinea) made contact with the South-east Asian plate (*c.* 40 m.y. B.P., *fide* Audley-Charles, 1987), a land-connection was made that could have allowed the *H. papuanum* group to migrate from New Guinea into (i) Java, Sumatra and (ii) the Philippines and Taiwan via the New Guinea track (Steenis, 1964; Smith, 1986).[2] On the other hand, the close relationship between the New Guinean 4. *H. bifurcatum* and 5. *H. papuanum* and the south-east African 8. *H. natalense* suggests that the early evolution of sect. *Humifusoideun* took place in Australia at a time when contact with the African plate was still possible. The occurrence of 9. *H. wilmsii* on both sides of the Mozambique Channel (implying a long period of evolution of sect. *Humifusoideum* in Africa) constitutes further evidence in favour of that hypothesis. Following this 're-entry' into Africa, there would thus appear to have been a subsequent northward and west-

[2] The similarity between this migration 'track' and the distributions respectively of *H. papuanum*, *H. pulogense* and *H. beccarii* (especially subsp. *steenisii*) is remarkable.

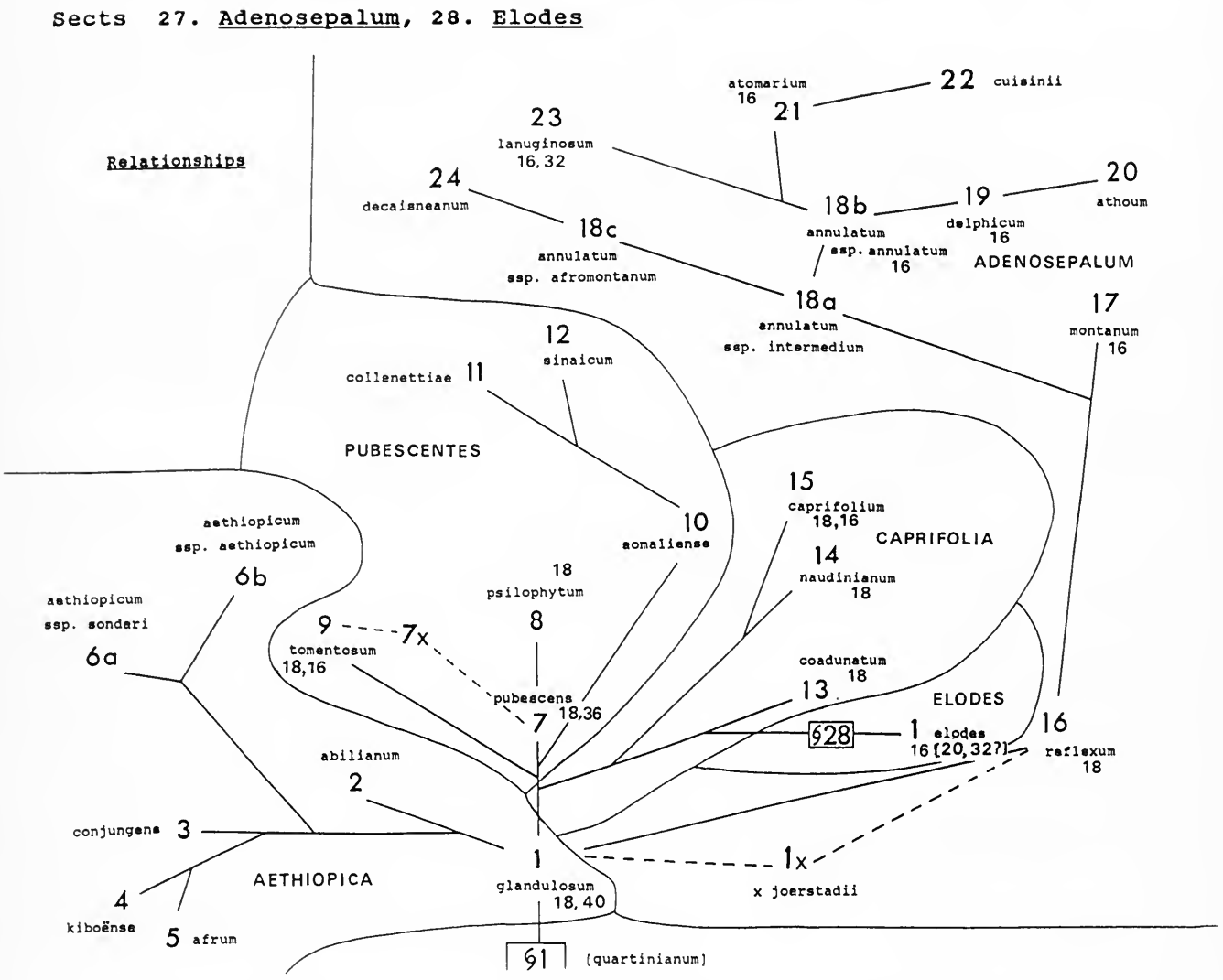


Fig. 11 Sects 27. *Adenosepalum* and 28. *Elodes*. Relationships and chromosome numbers (2n) of the 25 species. Limits of (named) subsections of sect. *Adenosepalum* and of sect. *Elodes* indicated by thin lines.

ward migration (Spp. 8–10) that also extended eastward to Madagascar (Map 29 (p. 166) and Robson, 1958: 441, map 2).

It should be reiterated that, with the exception of some probably wading-bird-dispersed species in sect. 30. *Trigynobrathys* (Robson, 1990: 11), there is practically no evidence for long-distance dispersal in *Hypericum*, so that the wide gaps in distribution in sect. *Humifusoideum* are very unlikely to have been achieved by such means.[3] On the other hand, vertical variation in land level in Australia and New Guinea and increasing aridity in Australia both imply that the New Guinea species reached their present montane refugia relatively late (Audley-Charles, 1987; Morley & Flenley, 1987; Robson, 1993*a*). It is not possible, from present evidence, to decide whether this happened before or after they died out in an increasingly arid Australia.

[3] *Pace* Smith (1977: 99), who placed a New Guinea montane *Hypericum* in a group with 'dust seeds weighing less than 0.1 mg which may also be predominantly wind-dispersed'. Also see Robson (1993*a*), where the distributional history of all the tropical montane groups of *Hypericum* is discussed.

Sects 27. *Adenosepalum* and 28. *Elodes*

Evaluation of sect. Elodes

From Fig. 11 (p. 88) it will be seen that sects 27 and 28 form a monophyletic group, but that sect. 27. *Adenosepalum* alone is paraphyletic. The justification for recognizing sect. *Elodes* is similar to that which was adduced for separating sect. 25. *Adenotrias* from sect. 24. *Heterophylla*: the development of a specialized pollination syndrome (Robson 1972, 1981). In general the two syndromes are very similar: the development of (i) stiffly erect sepals that confine the petals, thus forming a pseudo-tubular corolla with a subrotate 'limb'; (ii) a non-secreting ligule on each petal, which guides the tongue of a nectar-seeking insect; (iii) small bifid non-secreting structures at the base of the ovary, which alternate with the 'three' stamen fascicles and, like lodicules of grasses, swell to expand the corolla; and (iv) union of all the filaments in each fascicle for about 0.7 of their length. *H. elodes*, however, lacks the heterostyly present in sect. *Adenotrias* and the caruncles that adorn the seeds in that section.

When these specializations are discounted, however, *H. elodes* can be seen as a development of the *H. caprifolium* group of sect. *Adenosepalum* (Spp. 13–15). It shares with them a spreading indumentum and humid habitats with an Atlantic climate, taking these and other tendencies to extremes. Thus the indumentum extends to the sepals, not only to the base of the inflorescence; the testa sculpturing is ribbed-scalariform, not merely finely scalariform; the inflorescence usually develops from one axil only of the pair; and the habitat is aquatic, not merely moist or wet. In addition, *H. elodes* shows evidence of a diminution of hypericin content in that the inframarginal leaf glands are pale, the sepal marginal glands red and the anther gland amber, whereas all these glands in 15. *H. caprifolium* are black, as are all but the anther gland in 13. *H. coadunatum* and 14. *H. naudinianum*. In addition, the inframarginal black leaf-glands in *H. coadunatum* are irregularly spaced or even absent. In leaf shape, *H. elodes* is most similar to *H. coadunatum*, and its extreme Atlantic habitat is more like that of the Canary Islands than of the sub-Mediterranean areas of the other two species. The chromosome number of n = 10 (Delay, 1972) (if correct) would, however, indicate a separation of *H. elodes* from all three of the other species (n = 9, 8); but my own (unconfirmed) count of 2n = 32 would provide evidence for a derivation from within the *H. caprifolium* group. Support for the latter theory was provided by Al-Bermani et al. (1993), who recorded 2n = 16.

Characters and variation (Figs 11, 12)

MORPHOLOGY AND SUBDIVISION. The species in sects *Adenosepalum* and *Elodes* vary from bushy or straggling shrubs to wiry or soft perennial herbs. They can be divided into three groups, one wholly glabrous (Spp. 1–6) and two with indumentum (Spp. 7–15 and Spp. 16–24). The two Macaronesian species (1. *H. glandulosum*, 16. *H. reflexum*) are morphologically so distinct that intermediates, e.g. *H. glandulosum* with some indumentum, are assumed to be of hybrid origin (*H.* × *joerstadii*). Excluding these, presence of indumentum provides a clear-cut distinction between groups, except for forms of 17. *H. montanum* and 18a. *H. annulatum* subsp. *intermedium* that appear to be secondarily glabrous. The two indumentum-bearing groups can almost be differentiated by the absence (Spp. 7–15) or presence (Spp. 16–24) of bracts with glandular auricles or densely crowded basal glands. Only in the shrubby 16. *H. reflexum* and in 22. *H. cuisinii* and reduced forms of 23. *H. lanuginosum* are these completely absent; but they occur independently in the bracteoles of 15. *H. caprifolium*, in which however the

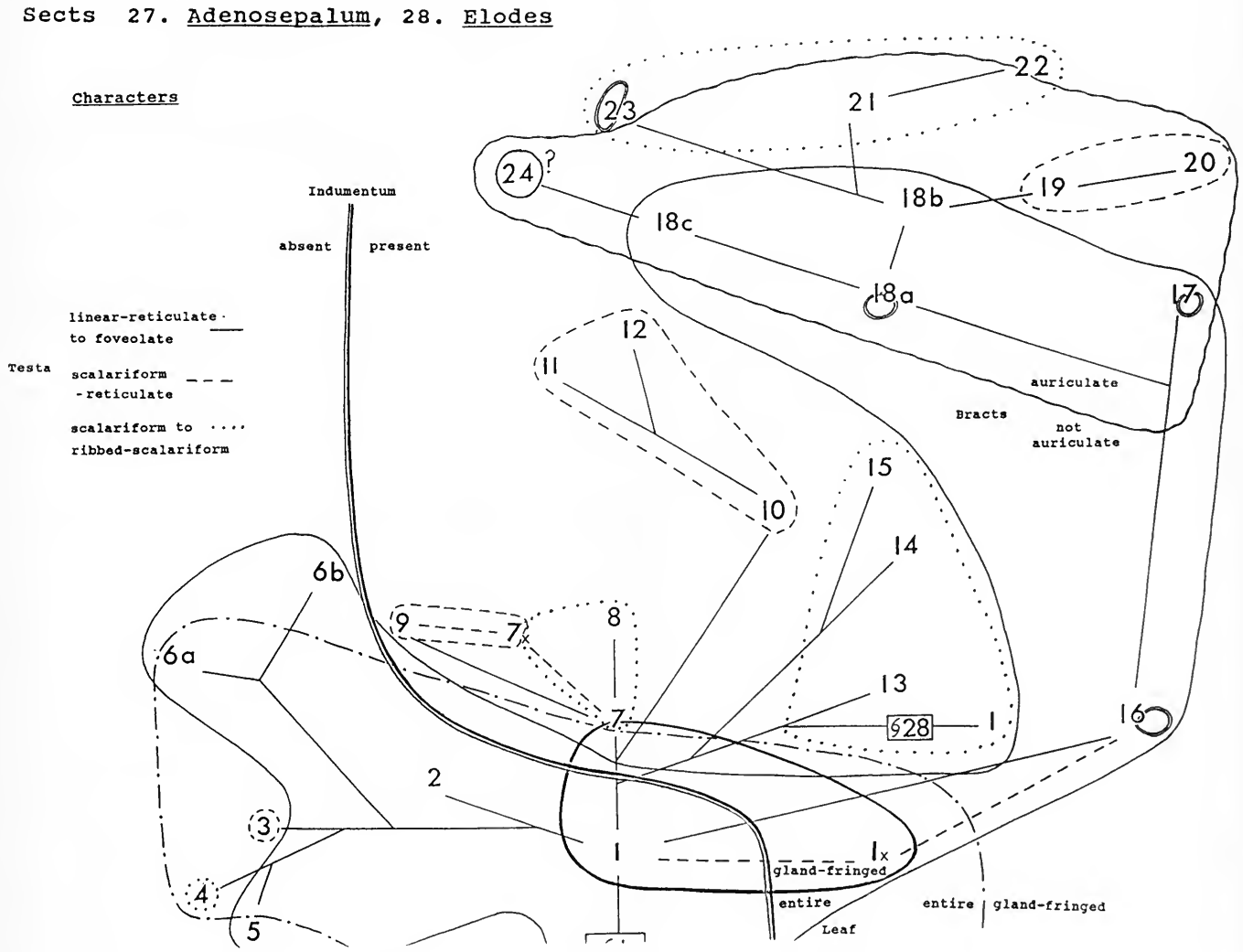


Fig. 12 Sects 27. *Adenosepalum* and 28. *Elodes*. Limits of certain characters. Note the isolated apomorphous occurrences of lack of indumentum.

pairs of leaves are united. If, in addition, the completely glabrous inflorescence and free leaves of Spp. 16–24 are contrasted with the pubescent inflorescence of Spp. 7–12 and the united leaf-pairs of Spp. 13–15, a subdivision of sect. *Adenosepalum* into four subsections becomes possible:

1. Subsect. *Aethiopica* (p. 172) – Plant completely glabrous; leaves free; bracts and bracteoles not glandular-auriculate. Spp. 1–6.
2. Subsect. *Pubescentes* (p. 181) – Plant with indumentum up to the sepals (Spp. 7, 9) or the lower part of the inflorescence (Spp. 10–12) or rarely only to the base of the inflorescence (Sp. 8); leaves free; bracts and bracteoles not glandular-auriculate. Spp. 7–12.
3. Subsect. *Caprifolia* (p. 189) – Plant with indumentum up to the base of the inflorescence; leaves all or mostly connate in pairs; bracts and bracteoles glandular-auriculate or not. Spp. 13–15.
4. Subsect. *Adenosepalum* (p. 193) – Plant with indumentum up to the base of the inflorescence or rarely stems (Sp. 23 in part) or leaves (Sp. 16) or wholly (Spp. 17, 18b, both in part) glabrous; leaves free; bracts and bracteoles usually glandular-auriculate.

The occurrence of protruding marginal leaf-glands, which gave rise to the epithet *glandulosum* for Sp. 1, appears to be a local apomorphism. Although *H. glandulosum* is basic to the whole of sect. *Adenosepalum*, these prominent leaf-glands have been observed elsewhere only on one, particularly large-leaved specimen of 7. *H. pubescens* from Morocco (*Lewalle* 9926, from Moyen Atlas), apart of course from some specimens of 1x. *H.* × *joerstadii*.

CYTOLOGY AND HYBRIDS. The ancestral group in sect. 1. *Campylosporus* from which sect. *Adenosepalum* arose almost certainly had a basic chromosome number of x = 12, 11 or 10, most likely 10 (see Robson, 1985: f. 1), but this number has been found only in 1. *H. glandulosum* (as 4x) and possibly in *H. elodes* (as 2x). All the other counts from sects *Adenosepalum* and *Elodes* (except for the problematic 2n = 20) are 2n = 18 or 36 (the latter in 7. *H. pubescens* only) or 2n = 16 or 32. The trend has thus been x = 10, 9, 8 with occasional tetraploidy on each basic number (Fig. 11). No count is recorded from subsect. *Aethiopica* other than 2n = 18, 40 from *H. glandulosum*; subsect. *Pubescentes* has 2n = 18, 36, 16; subsect. *Caprifolia* has 2n = 18, 16; and subsect. *Adenosepalum* 2n = 18, 16, 32. In sect. *Elodes* the recorded numbers are 2n = 16, 20, 32.

Natural hybrids apparently occur between 1. *H. glandulosum* and 16. *H. reflexum* (*H.* × *joerstadii*) and between 7. *H. pubescens* and 9. *H. tomentosum* (*H. tomentosum* var. *intermedium*). In cultivation, 17. *H. montanum* was successfully hybridized with *H. tetrapterum* Fr. (= *H. acutum* Moench) and *H. maculatum* Cr., species in sect. 9. *Hypericum* with the same chromosome number (2n = 16). The fertility, however, was low and the plants (*H. tetrapterum*) and seedlings (*H. maculatum*) were variegated (cf. Noack, 1934; Robson, 1981: 171). Noack also produced hybrids between *H. montanum* and *H. perforatum* L. (sect. *Hypericum*, 2n = 32), this time less sterile but pentaploid, because of the apomictic ovules in *H. perforatum* (Noack, 1939).

Distribution and evolution (Fig. 13)

The most similar species to 1. *H. glandulosum* (Canary Islands, Madeira) in sect. 1. *Campylosporus* would appear to be *H. quartinianum* (SW Arabia, E. Africa) rather than the closely related *H. synstylum* (Ethiopia, N. Somalia) suggested in Robson (1985) (see p. 175). This distributional gap is comparable with that between *H. revolutum* subsp. *revolutum* (sect. *Campylosporus*) and *H. canariense* (sect. 21. *Webbia*) (see p. 135). But, whereas *H. canariense* is related to the eastern Mediterranean sect. 22. *Arthrophyllum*, the relationships of the Macaronesian *H. glandulosum* and *H. reflexum* are with the African mainland.

One, clearly ancient trend (i) gave rise to subsect. *Aethiopica* in tropical and south Africa, with the relict Angolan 2. *H. abilianum* in the west and all the other species in the east. These form two pairs, a southern pair of subspecies (6. *H. aethiopicum*) with a disjunct occurrence in Angola of the more highly evolved form of 6a. subsp. *sonderi*, and a more northern pair of species (3. *H. conjungens*, 4. *H. kiboënse*) with an outlying derivative in NW Africa (5. *H. afrum*).

The second trend directly related to *H. glandulosum* (ii) comprises subsects *Pubescentes* and *Caprifolia*. In *Pubescentes*, 7. *H. pubescens* is distributed from southern Morocco north to the southern Iberian Peninsula thence eastward to western Libya, Malta, Sicily, southern Italy? and Sardinia (extinct?). In the south of Morocco, where it becomes reduced in habit and in size of parts, it approaches the apparently derivative 8. *H. psilophytum*, with short appressed stem-hairs. This species is confined to the Central Saharan mountains of southern Algeria (Ahaggar, Tefedest and Tassili n'Ajjer) and two localities in the southern Moroccan Atlas. The very closely related 9. *H. tomentosum* occupies a generally more northern area: northern Morocco and NW Algeria, Spain and central Portugal, mediterranean France and adjacent Italy, and the larger islands (Corsica – extinct?, Sardinia, Majorca). It is also recorded from further east in Algeria and in Tunisia. In some parts where its distribution overlaps that of *H. pubescens*, intermediates (hybrids) occur (e.g. in SE Spain (Valencia), the Morocco–Algeria border area and possibly Sardinia).

The other part of subsect. *Pubescentes* is separated from 7. *H. pubescens* by the width of Africa. 10. *H. somaliense* (N. Somalia), 11. *H. collenettiae* (Saudi Arabia: Asir) and 12. *H. sinaicum* (Mt Sinai and mountains east of the Gulf of Aqaba in Saudi Arabia) form a geographical and morphological reduction series northward, each population being small and isolated. According to Mrs Sheila Collenette, her eponymous species may already be extinct.

Subsect. *Caprifolia* and sect. *Elodes* form a north-western group. 14. *H. naudinianum* (NW Morocco, adjacent Algeria) is morphologically nearest to *H. pubescens* in most respects and 13. *H. coadunatum* (Gran Canaria) is in others; so it seems likely that an ancestral group diverged from *H. pubescens* (or its precursor) before it in turn differentiated into a mainland and an island species. Each then differentiated to form another species, the eastern Spanish 15. *H. caprifolium* from *H. naudinianum* and *H. elodes* from *H. coadunatum*; or perhaps *H. elodes* arose before Spp. 13 and 14 differentiated.

Subsect. *Adenosepalum* also has its primitive species in the Canary Islands (16. *H. reflexum*), and its derivatives likewise split into (north-) eastern and (south-) western groups. The western group consists of only 17. *H. montanum*, which extends in distribution from Morocco northward to northern England and central Scandinavia and eastward to Poland, the Ukraine, Georgia and adjacent Turkey but is absent from most of the Mediterranean peninsular regions and the islands. This species can be separated from the eastern 18. *H. annulatum* only by the denser inflorescence and/or the distribution of indumentum. *H. annulatum* itself has a widely disjunct distribution. The form nearest to *H. montanum* occurs in Saudi Arabia (Asir) and the adjacent African mainland, whence there is a morphological trend through Ethiopia, Kenya and Uganda to northern Tanzania. This can be split into a northern and a southern subspecies (18a. subsp. *intermedium* and 18c. subsp. *afromontanum* respectively) with a somewhat intermediate population in eastern Ethiopia (Harar). A dwarf species related to the northern subsp.

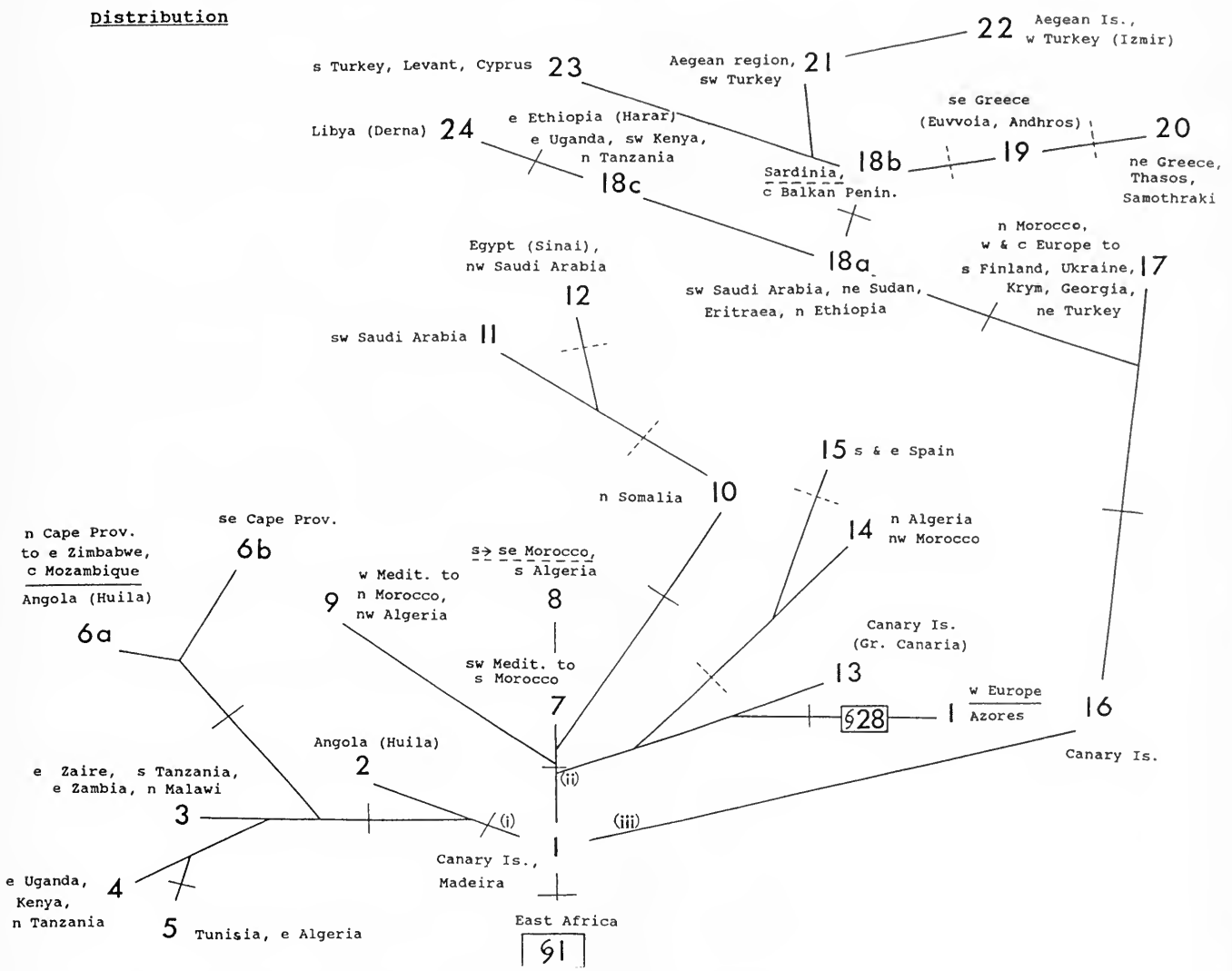


Fig. 13 Sects 27. *Adenosepalum* and 28. *Elodes*. Distribution of the 25 species. For key to annotations see Fig. 3 (p. 00) except for minor disjunctions, which are indicated in two degrees, lesser (- - -) and greater (—).

intermedium occurs in the Derna massif of NE Libya (24. *H. decaisneanum*), having presumably reached that area when the Saharan region had an equable climate.

A more extreme disjunction, however, separates *H. annulatum* subsp. *intermedium* from 18b. subsp. *annulatum*, a plant of the Macedonian region of the Balkan Peninsula and also two mountains in Sardinia (Arrigoni et al., 1973). Despite the wide separation of these populations from each other and the even wider separation of both from the nearest African population, the morphological variation is such that the European populations together only just merit subspecific rank. Despite this relative lack of variation, there is no evidence that they reached their present area by long-distance dispersal; and the occurrence of related derivative species in the Aegean and eastern Mediterranean regions also favours the theory of an ancient land-migration of *H. annulatum*.

These relatives of *H. annulatum* form two morphoclines. Two relatively longer-haired species occupy isolated areas in the west and north Aegean: the erect 19. *H. delphicum* in the islands Evvoia (Euboea) and Andhros and the spreading 20. H. *athoum* in the Athos Peninsula of northern Greece and the northern islands of Thasos and Samothráki. These are morphologically quite distinct from *H. annulatum*, but the other, south-eastern morphocline is not so well isolated. 21. *H. atomarium* occurs on both sides of the Aegean, in the Peleponnisos and western Turkey, as well as on the eastern islands of Lesvos, Khiós, Ikaría and Rhodos. In Khiós and Ikaría a reduced 'form' of it, which is found in higher and more exposed habitats, is treated here as a species, 22. *H. cuisinii*, although the morphological 'gap' between it and island plants of *H. atomarium* appears to be small and could conceivably prove to be non-existent. A more reduced form of *H. cuisinii* is found on Karpathos and apparently Khasos, and the typical form also occurs on the Turkish mainland (Boz Dağ). The morphocline continues eastward in 23. *H. lanuginosum*, of which the distribution slightly overlaps that of *H. atomarium* in the Antalya region of south-western Turkey. From there the area extends round the Mediterranean margin as far as Israel (Judaea) and Jordan (Gilead), and this species also occurs in northern Cyprus. A specimen from the 1830s labelled 'Sinai' indicates, if the label is to be believed, that *H. lanuginosum* was once

found further south; but I know of no more recent records from there. Morphologically extreme populations in southern Turkey from higher altitudes ('var. *scabrellum*') and the extreme west of vil. Antalya ('var. *pestalozzae*') are linked to the more typical form by a continuous series of intermediates.

SYSTEMATIC TREATMENT[4]

Sect. 20. **MYRIANDRA** (Spach) R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 214 (1893).

Shrubs, shrublets or perennial herbs up to 4.5 m tall, (the shrubs) deciduous, glabrous, without dark glands; branching dichasial/monochasial or rarely pseudo-dichotomous or mixed. *Stems* 2–4(–6)-lined and usually compressed (ancipitous) when young, usually becoming terete, apparently eglandular; cortex exfoliating in flakes or strips; bark thin and smooth or corky and sometimes with laticifers. *Leaves* opposite, decussate, sessile to subsessile, free, deciduous at basal articulation (where present) or persistent; lamina entire, with venation pinnate and closed to 1-nerved, with tertiary venation densely to laxly reticulate or absent; laminar glands punctiform; marginal gland dots dense; ventral glands absent. *Inflorescence* 1-∞(over 70)-flowered from uppermost node, sometimes also from up to 10 nodes below, branching dichasial or rarely pseudo-dichotomous or mixed, sometimes with subsidiary flowering branches from up to 8 lower nodes; bracts and bracteoles usually reduced, rarely transitional. *Flowers* stellate, homostylous. *Sepals* (3–)4–5(–6), free, persistent and spreading to reflexed or deciduous in fruit, with margin entire; veins 1–5(–9); laminar glands punctiform; marginal glands rather sparse, submarginal and inframarginal glands absent. *Petals* (3–)4–5(–6), deciduous, with apiculus present, lateral or rarely subapical, apiculate to obtuse or acute, or absent; margin entire, marginal glands absent; laminar glands sparse, striiform to punctiform, or absent. *Stamen fascicles* 4–5, not distinguishable individually, forming continuous narrow to broad band of 30–650 stamens (i.e. 6–30 per fascicle), stamens individually deciduous or persistent; filaments free; anthers yellow, gland amber; pollen type VII. *Ovary* with 2–5 incompletely axile to parietal placentae, each ∞-ovulate; styles 2–5(6), free but mutually wholly or partly appressed at anthesis, later often ± spreading or recurved; stigmas minute. *Capsule* 2–5-valved, subcoriaceous, not vittate. *Seeds* ± broadly cylindric, carinate or not, without apical expansion; testa linear-reticulate or reticulate to linear-foveolate or scalariform-reticulate or scalariform.

BASIC CHROMOSOME NUMBER (X). 9, 8; ploidy 2, 3 (cf. Sp. 5), 4? (cf. Sp.1).

HABITAT. Open, dry (cedar glades, barrens, shales, river bottoms, rocky slopes, dry woods) or damp to wet (moist crevices, ditches, seepage areas, meadows, marshes, bogs, swamps, ponds and lakesides), on granite or limestone or (Cuba) white sand; 0–1560 m (N. America), –1650 m (Jamaica), –1800 m (Guatemala), –2000 m (Cuba), –2900 m (Hispaniola).

DISTRIBUTION. Canada (Newfoundland to Ontario), eastern U.S.A. (westward to Minnesota, Iowa, Kansas, Oklahoma and Texas), eastern Mexico, Belize, Guatemala, Honduras, Greater Antilles, Bahamas, Bermuda, Azores (introduced?) 29 species (+ 2 subspecies).

[4] In this part (Part 6), an asterisk (*) before a locality or after a herbarium symbol indicates that the specimen has not been seen by me. After a type specimen in sect. 20 *Myriandra*, it indicates that that type has been seen by Dr Adams. As in previous parts, type material seen by me is indicated by an exclamation mark (!).

Key to sect. 20. *Myriandra* (excluding garden hybrids)

1 Sepals and petals each 5 (except in occasional flowers in Spp. 1, 3, 22) or, if 4(3), then sepals small, subequal, not enclosing capsule 2

Sepals and petals each 4; sepals in markedly unequal pairs, the outer large, enclosing capsule (subsect. 5. *Ascyrum*) 27

2(1) Leaves articulated at base, sessile or pseudopetiolate, not amplexicaul; stamens deciduous (subsect. 1. *Centrosperma*) 3

Leaves not articulated at base or, if so (Sp. 23), then amplexicaul; stamens persistent (except in Spp. 16, 17, 23) 18

3(2) Leaves with lamina expanded when mature, visible on both sides of midrib; sepals expanded 4

Leaves acicular even when mature, usually ± only midrib visible beneath; sepals acicular 9

4(3) Inflorescence 1–3(–7 or rarely more)-flowered from uppermost node, sometimes with single flowers at 1(2) nodes below 5

Inflorescence (1)3–*c.* 25-flowered from uppermost node, with triads, dichasia or flowering branches from 1–4 nodes below 6

5(4) Gynoecium 3-merous; leaves 8–22 mm wide, margin plane or subrecurved; plant (0.6–)1–3 m tall; sepals in flower 4–10 mm wide ..... 1. **frondosum**

Gynoecium usually 5-merous; leaves 3–7(–10) mm wide; margin subrecurved to revolute; plant 0.14–0.6(–1) m tall; sepals in flower 1.5–5 mm wide ..... 3. **kalmianum**

6(4) Inflorescence broadly to (usually) narrowly elongate-cylindric with 1–5-flowered lateral dichasia from 2–4 nodes; capsule 7–13 mm long or stems 6-lined when young 7

Inflorescence shortly and broadly globose-cylindric or obpyramidal with (2–)5–15-flowered lateral dichasia from 1–3 nodes; capsule 5–7 mm long; stems 4-lined when young 8

7(6) Leaves 30–70 mm long, narrowly oblong to narrowly elliptic or oblanceolate; flowers 15–30 mm in diam.; placentation incompletely axile; capsule 7–13 mm long; seeds 1.5–2 mm long ..... 2. **prolificum**

Leaves 15–32(–37) mm long, very narrowly oblong-elliptic or oblanceolate to linear; flowers 9–14 mm in diam.; placentation parietal; capsule 4.5–6 mm long; seeds 0.7–0.8 mm long ..... 6. **galioides**

8(6) Ovary (3–)4–5-merous; capsule deeply lobed; sepals narrowly elliptic or narrowly oblong to oblanceolate-spathulate, basal veins 3–7 ..... 4. **lobocarpum**

Ovary 3–4(–5)-merous; capsule not or scarcely lobed; sepals narrowly oblong-lanceolate or narrowly oblong to oblong-spathulate, basal veins 1–3 ..... 5. **densiflorum**

9(3) Stems 6-lined when young, usually decumbent and mat-forming 10

Stems 4-lined when young, erect 11

10(9) Leaves 4–11 mm long when mature; flowers sessile or almost so; sepals 2–4 mm long ..... 7. **tenuifolium**

Leaves 13–25 mm long when mature; flowers with pedicels *c.* 0.5 mm; sepals (3–)4.5–7 mm long ..... 8. **lloydii**

11(9) Capsule cylindric or rarely very narrowly conic or ovoid-conic; leaf midrib below level of inrolled margins; bark smooth but not metallic-silvery 12

Capsule ± narrowly ovoid-conic to ovoid or ellipsoid; leaf midrib

level with inrolled margins but separated from each by a papillae-lined groove; bark smooth and metallic-silvery or corky to spongy 16

12(11) Sepals articulated, deciduous; inflorescence overall mostly cylindric, from up to 7 nodes, branching dichasial 13

Sepals not articulated, persistent; inflorescence overall obconic, from terminal node only, branching mixed dichasial/pseudo-dichotomous ..... 10. **limosum**

13(12) Capsule (4.5–)5–7 mm long; styles shorter than ovary; mature leaves mostly 10–26 mm long, equalling or slightly exceeding those in axillary clusters (9. **nitidum**) 14

Capsule 3.5–5 mm long; styles longer than ovary; mature leaves mostly 6–11 mm long, usually twice as long as those in axillary clusters ..... 11. **brachyphyllum**

14(13) Leaves coriaceous with apex rounded to rounded-apiculate; petals mostly 8–10 × 5–6.5 mm; sepals rounded-apiculate to obtuse ..... 9a. **nitidum** subsp. **cubense**

Leaves subcoriaceous to chartaceous with apex rounded-apiculate to long-acuminate; petals mostly 5–7 × 3–4 mm; sepals shortly apiculate to acute 15

15(14) Leaf apex rounded-apiculate to obtuse, margin loosely inrolled; sepals shortly apiculate to acute; plant to 3 m or more tall with ± numerous stout bushy-branched stems from base ..... 9b. **nitidum** subsp. **nitidum**

Leaf apex acute to long-acuminate, margin tightly inrolled; sepals acute to long-acuminate; plant to *c.* 1 m tall with few slender little-branched stems from base ..... 9c. **nitidum** subsp. **exile**

16(11) Bark smooth, metallic-silvery, without laticifers, exfoliating in large thin curled plates; styles *c.* 5 mm long; seeds 1–1.6 mm long; young stems, leaves and sepals strongly glaucous ..... 12. **lissophloeus**

Bark thin corky to thick corky and spongy, containing ± conspicuous vertical laticifers, exfoliating in thin papery sheets or plates; styles 2.5–4 mm long; seeds 0.4–0.8 mm long; young stems, leaves and sepals not glaucous 17

17(16) Stem internodes persistently ancipitous-winged when young; bark with cork layers thin, smooth and containing inconspicuous thread-like laticifers, not becoming thick on old stems; terminal inflorescence (3–)7–32-flowered ..... 13. **fasciculatum**

Stem internodes soon terete when young; bark with cork layers 3–4 mm thick, striate on account of coarse laticifers, becoming thick and spongy on old stems; terminal inflorescence 1–3-flowered ..... 14. **chapmanii**

18(2) Plant a decumbent mat-forming broad-leaved dwarf wiry shrub; inflorescence 1–3-flowered (subsect. 2. *Pseudobrathydium)* ..... 15. **buckleyi**

Plant an erect shrub or decumbent to rhizomatous subshrub or herb, if broad-leaved then a herb or inflorescence ∞-flowered 19

19(18) Sepals very unequal to subequal, persistent; stamens 120–*c.* 200; inflorescence widely branched (subsect. 4. *Brathydium*) 20

Sepals unequal and deciduous or subequal to equal and persistent; stamens 30–95; inflorescence narrowly branched (subsect. 3. *Suturosperma*) 21

20(19) Leaves deciduous, (5–)7–20 mm wide, oblong-ovate or ovate to triangular-lanceolate, base ± cordate-amplexicaul; erect (often unbranched) shrub with bark on older stems corky ..... 23. **myrtifolium**

Leaves persistent, 3–5 mm wide, linear-elliptic to linear, base narrowly cuneate to rounded; decumbent ± branching subshrub with bark thin or absent ..... 24. **dolabriforme**

21(19) Sepals and usually stamens ± tardily deciduous; leaves oblong to linear-oblong or elliptic to ovate-lanceolate, (7–)10–25 mm wide; placentation incompletely axile; shrubs 22

Sepals and stamens persistent; leaves mostly narrowly oblong or triangular-oblong to linear, 1–10(–15) mm wide; placentation parietal; shrubs, subshrubs or perennial herbs 23

22(21) Inflorescence terminal only, (1)3–5(–8)-flowered; sepals 1.5–3 mm wide; capsules 6–14 × 4.5–7 mm; seeds with low ridge ..... 16. **apocynifolium**

Inflorescence sometimes from more than one node, the terminal one 7–*c.* 45-flowered; sepals 1–1.5 mm wide; capsule 3.5–7 × 3–5 mm; seeds markedly carinate ..... 17. **nudiflorum**

23(21) Inflorescence 1–3-flowered; perianth mostly 4-merous; leaves 1–3 mm wide; shrub ..... 19. **microsepalum**

Inflorescence 7–10-flowered or, if flowers 1–6, then plant herbaceous; perianth almost always 5-merous; leaves (1–)3–15 mm wide; shrubs to herbs 24

24(23) Capsule ovoid-cylindric to broadly ovoid; plant a shrub *c.* 0.5–1.3 m tall, base unbranched ..... 18. **cistifolium**

Capsule broadly ovoid to depressed-globose or, if ovoid-ellipsoid to ellipsoid, then plant a rhizomatous herb to 0.8 m tall and branched from base 25

25(24) Plant a subshrub, not or rarely rhizomatous; capsule broadly ovoid to depressed-globose; seeds 2–2.7 mm long ..... 20. **sphaerocarpum**

Plant a rhizomatous herb; capsule ovoid-ellipsoid; seeds 0.6–0.7 mm long 26

26(25) Leaves narrowly oblong or narrowly lanceolate to linear (l:b = *c.* 6–8); plant relatively stout, usually 0.4–0.8 m tall ..... 21. **adpressum**

Leaves elliptic or ovoid-elliptic to oblanceolate (l:b = 2–4); plant relatively slender, usually 0.1–0.2 m tall ..... 22. **ellipticum**

27(1) Styles and placentas 3(4); stamens 70–100 28

Styles and placentas 2; stamens 30–50 30

28(27) Leaf base cordate-amplexicaul; inflorescence terminal, branching pseudo-dichotomous ..... 26. **tetrapetalum**

Leaf base cuneate to truncate or very rarely subcordate-amplexicaul; inflorescence from 1–5 nodes, branching dichasial and/or pseudo-dichotomous 29

29(28) Outer sepals apiculate to rounded; leaves without basal gland-like auricles, margin plane to subrecurved; terminal inflorescence 1–3(–7)-flowered, branching nearly always wholly dichasial ..... 25. **crux-andreae**

Outer sepals acute to subacuminate; leaves with basal gland-like auricles, margin subrecurved to subincrassate; inflorescence 1-flowered, branching pseudo-dichotomous ..... 27. **edisonianum**

30(27) Pedicels elongate (bracteoles near uppermost leaves), reflexed soon after anthesis; leaves without basal gland-like auricles ..... 28. **suffruticosum**

Pedicels short (bracteoles close to sepals), persistently erect; leaves with basal gland-like auricles (29. **hypericoides**) 31

31(30) Plant erect; stems 0.3–1.5 m, unbranched from base but freely branched above; leaves oblong to linear, 7–25 mm long ..... 29a. **hypericoides** subsp. **hypericoides**

Plant decumbent to prostrate; stems 0.05–0.3 m, branched from base; leaves oblanceolate or oblong-spathulate or, if narrowly oblong, then 3–10 mm long 32

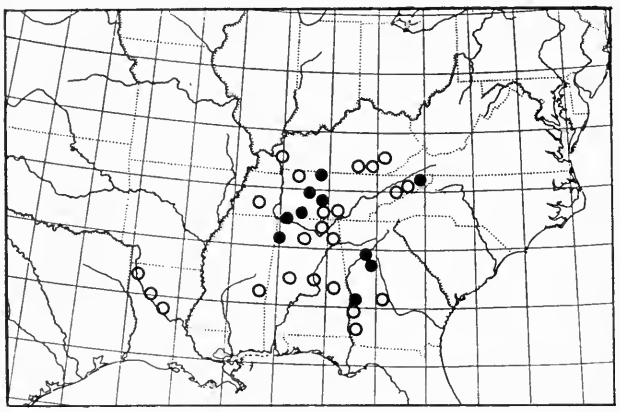
32(31) Plant decumbent; leaves usually oblanceolate, 10–20 × 3–6 mm long; inflorescence-branching dichasial or lateral ..... 29b. **hypericoides** subsp. **multicaule**

Plant prostrate; leaves narrowly oblong to oblong-spathulate, 3–8(–10) × 1–2.5 mm long; inflorescence-branching pseudo-dichotomous ..... 29c. **hypericoides** subsp. **prostratum**

Subsect. 1. **Centrosperma** R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 214 (1893). Type: *H. prolificum* L. (lectotype, W.P. Adams, 1962).

Shrubs with leaves articulated at base, deciduous; inflorescence-branching dichasial (or mixed dichasial/pseudo-dichotomous in 10. *H. limosum*), mainly basipetal; sepals 5 (very rarely 4), very unequal to subequal or rarely equal, deciduous; petals 5 (rarely 4); stamens 30–650, deciduous; styles and placentae (2)3–5(6), placentation incompletely axile to parietal. Species 1–14.

1. **Hypericum frondosum** Michx., *Fl. bor.-amer.* **2**: 81 (1803); Poir., *Encycl.*, Suppl. **3**: 694, 699 (1813); Pursh, *Fl. Amer. sept.*: 375 (1814); Choisy, *Prodr. monogr. Hypéric.*: 38 (1821), in DC., *Prodr.* **1**: 554 (1824); Spach in *Annls Sci. nat.* (Bot.) **II**, **5**: 364 (1836) sub *Roscyna* sine comb.; Sprague in *Curtis's bot. Mag.* **139**: t. 8498 (1913); Lott in *J. Arnold Arbor.* **19**: 149 (1938); Svenson in *Rhodora* **42**: 15 (1940); Rehd., *Man. cult. trees* 2nd ed.: 640 (1940); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 16 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 69 (1973); Correll & Johnston, *Man. Vasc. Pl. Texas*: 1063 (1970); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 413 (1973); Clewell, *Guide vasc. pl. Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines N. Florida, etc.*: 370 (1988); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 67, ff. 10.1, 10.9 (1995). Type: U.S.A., Tennessee?, 'ad flumen Tennassee', n.d. (st), *Michaux* s.n. (P-holotype, BM!-microfiche; GH*-photograph & sketch).



Map 1 Sect. 20: 1. *H. frondosum* ● specimens, o records.

Fig. 14A, Map 1.

H. aureum W. Bartram, *Travels Carolina:* 383 (1791); Torrey & Gray, *Fl. N. Amer.* **1**: 161 (1838); Chapm., *Fl. South. U.S.*: 40 (1865); Coulter in *Bot. Gaz.* **11**: 84 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 286 (1897); Small, *Fl. s.e. U.S.*: 790 (1903), *Man. s.e. fl.*: 872 (1933); Sprague in *Curtis's Bot. Mag.*: t. 8498 (1913); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 754 (1960); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 67, ff. 10.1, 10.9 (1995), non Loureiro (1790). Type: U.S.A., Georgia, Flint R. Taylor Co., Patse-Liga [Patsilaga] creek, 1776 (fl), *Bartram* Book D/5 (BM!-holotype).

H. amoenum Pursh, *Fl. Amer. sept.* **2**: 375 (1814). Type: U.S.A., 'in South Carolina and Georgia', *Lyon* s.n. (OXF-holotype).

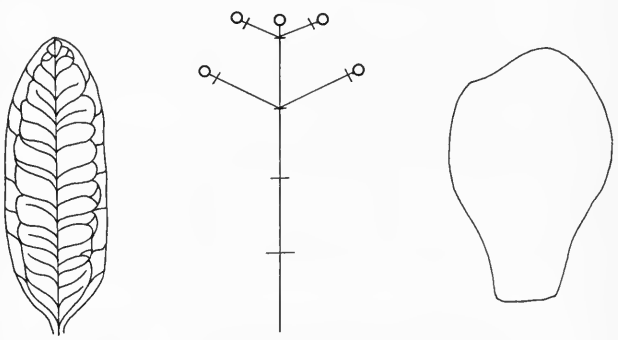
H. rugelianum Kunze in *Linnaea* **24**: 177 (1851). Type: cultivated in Leipzig Bot. Gard. from seed ex U.S.A., Tennessee, Oberland Mts, *Rugel* (LZ†-holotype).

Brathydium aureum (W. Bartram) K. Koch, *Hort. dendrol.*: 66 (1853).

B. rugelianum (Kunze) K. Koch, *Hort. dendrol.*: 67 (1853).

Hypericum prolificum [var.] β *aureum* (W. Bartram) Koehne, *Deut. Dendrol.*: 416 (1893).

H. splendens Small in *Bull. Torr. bot. Club* **29**: 291 (1901), *Fl. s.e. U.S.*: 790 (1903), *Man. s.e. fl.*: 872 (1933); Svenson in *Rhodora* **42**: 15 (1940). Type: U.S.A., Georgia, De Kalb Co., Stone Mt., 506 m, 4 July 1893 (fl), *Small* s.n. (NY-holotype; A!, F!, US!-isotypes).



Icon: Sprague in *Curtis's bot. Mag.* **139**: t. 8498 (1913).

Shrub (0.6–)1–3 m tall, erect, much branched above base, with branches lateral, strict to spreading, forming rounded bush or small 'tree'. *Stems* green, 4-lined and ancipitious when young, soon 4-lined and rounded, becoming reddish brown and 2-lined to terete in 2nd or 3rd year; cortex exfoliating in strips or (often large) plates; bark pale grey, smooth, thin. *Leaves* sessile, ascending to spreading; lamina 25–65 × 8–22 mm, oblong to lanceolate-oblong or sometimes narrowly elliptic to oblanceolate, plane or with margin subrecurved, paler or somewhat glaucous beneath or wholly ± glaucous, chartaceous, deciduous at basal articulation, apex apiculate-obtuse to rounded, base broadly cuneate and attenuate to narrowly cuneate; venation sometimes rather obscure: *c.* 10–16 pairs main laterals with subsidiaries and densely reticulate tertiaries, midrib prominent; laminar glands dense. *Inflorescence* 1–3(–7)-flowered, sometimes with paired single flowers or triads or 1–3-flowered branches at node below and very rarely single flowers at third node ('*H. splendens*'); pedicels 1.5 (terminal)–10 mm long; bracts foliar or reduced, oblong-elliptic. *Flowers* 25–45 mm in diam.; buds globose. *Sepals* 5(4), 6–14(–20) × 4–10 mm, enlarging in fruit, imbricate, very unequal, ovate or oblong to elliptic or elliptic-spathulate or sometimes foliaceous, rounded or apiculate-obtuse, plane or margin recurved, basal veins (3)5–7(9), branching and densely reticulate distally. *Petals* 5(4), golden yellow to orange-yellow, base soon brownish, becoming incurved-deflexed, 12–25 × 6–14 mm, 1.25–2 × sepals, obovate to oblanceolate, with apiculus lateral (petals sometimes bifid), rounded. *Stamens* c. 250–650, longest 9–12 mm, 0.45–0.75 × petals. *Ovary* 3-merous, 6–8 × 3–4(–5) mm, ± narrowly pyramidal-ovoid to broadly ellipsoid, acute to apiculate-obtuse, placentation incompletely axile; styles 3, 4–6 mm long, 0.65–0.75 × ovary, remaining erect. *Capsule* 12–15 × 6–8 mm, narrowly ovoid-conic to broadly ovoid-rostrate, rounded-trigonous, exceeding or shorter than sepals and often initially surrounded by them, thickly coriaceous. *Seeds* blackish brown, *c.* 1.5 mm long, carinate; testa shallowly linear-reticulate. 2n = 18 (Hoar & Haertl, 1932; Adams in Robson & Adams, 1968), 36 (see note below).

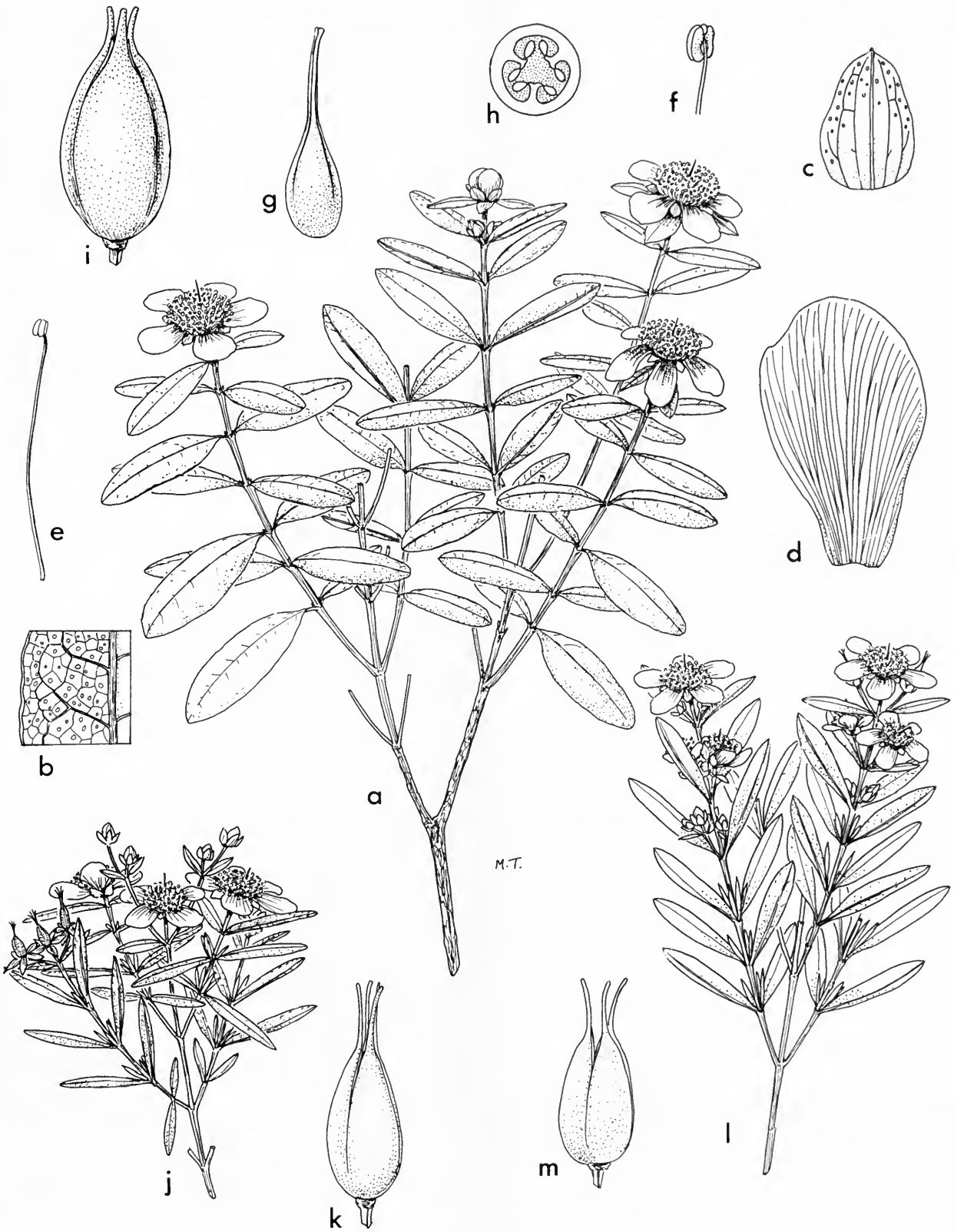


Fig. 14 A. *H. frondosum*: (a) habit; (b) leaf (part); (c) sepal; (d) petal; (e) stamen; (f) anther; (g) ovary; (h) ovary, T.S.; (i) capsule. B. *H. kalmianum*: (j) habit; (k) capsule. C. *H. prolificum*: (l) habit; (m) capsule (a, j, l × ½; b-d, g, i, k, m × 4; f × 6). A. *Kral* 39725. B. *Baril* 2256. C. *Demaree* 45955.

Dry cedar glades and barrens on limestone and calcareous shales, also (*Demaree* 405749) 'swampy creek bottoms'; 180–506 m.

U.S.A. (southwestern end of the Appalachian Range), in northern and central Georgia, northern Alabama, eastern Mississippi, northern Louisiana, eastern Tennessee and southern Kentucky; also recorded from eastern Texas. Adventive in Connecticut, New York and Massachusetts (*fide* Adams, 1962).

U.S.A. Alabama: Franklin Co., Russelville, 26 June 1970 (fl), *Kral* 39725 (BM); *Morgan Co., 3.2 km S. of Tennessee R., S. of Huntsville, *Godfrey* 57520 (FSU); Lawrence Co., 1.75 km S. of Moulton, 26 June 1970 (fr), *Kral* 41278 (BM). Georgia: De Kalb Co., Stone Mt, NW slope, 390 m, 10 July 1900 (fl), *Wilson* 13 (BM, K); Quitman Co., Chattahoochee R. above Georgetown, 16 October 1902 (fr), *Harper* 1755 (BM). Kentucky: *Crittenden Co., Dycusburg overlooking Cumberland R., 16 June 1969 (fl), *Athey* 695 (MO); *Wayne Co., S. of Monticello, *Smith & Hodgdon* 3978 (GH, NY). Louisiana: *Natchitoches Par., *c.* 6.4 km E. of Provencal, *Correll* 9829 (DUKE, NY). Mississippi: *Clark Co., 6 October 1929, *Ashe* s.n. (UNC). Tennessee: Bedford Co., 4 km S. of Shelbyville, 29 August 1958 (fr), *Godfrey* 57535 (BM, FSU*); Rutherford Co., La Vergne, 180 m, 24 June 1962 (fl), *Demaree* 45749 (BM); Wilson Co., Cedar Glades, 3.2 km N. of Lebanon, 28 August 1958 (fr), *Godfrey* 57498 (BM, FSU*). Texas: *fide* Correll & Johnston (1970).

CULTIVATED. Specimens seen from England (1904–1988), Holland (1920) and U.S.A. (1897–1959).

H. frondosum has the most primitive characters of any species in sect. *Myriandra*, its nearest (ancestral) species being *H. synstylum* N. Robson from Ethiopia and Somalia (sect. 1. *Campylosporus*). Only one character, trimery of the gynoecium, might be regarded as specialized in comparison with 3. *H. kalmianum* L. and 4. *H. lobocarpum* Gatt. Since these species, however, are much more specialized in their other characters, there are grounds for assuming that pentamery of the gynoecium is advanced, not primitive, in this section; and its constant trimery in *H. frondosum* would support this assumption.

H. frondosum is the nodal species in sect. *Myriandra*, being related to species in three subsections. Through 2. *H. prolificum* it is related to the rest of subsect. *Centrosperma*, through 23. *H. myrtifolium* to subsect. *Brathydium*, and through 25. *H. crux-andreae* to subsect. *Ascyrum*. From *H. prolificum* it can be distinguished (at least in natural habitats) by the larger leaves, flowers and fruits and by the virtual restriction of the inflorescence to the terminal node. When flowers are present at lower (1–2) nodes, they are solitary or rarely 3 in each leaf axil. The larger floral parts also help to distinguish *H. frondosum* from the other two related species. In addition, *H. myrtifolium* has cordate-amplexicaul leaves, whilst *H. crux-andreae* has a tetramerous perianth and spreading styles. At least in cultivation, *H. frondosum* itself produces a few flowers with a tetramerous perianth, thus indicating where '*Ascyrum*' has been derived from *Hypericum*.

The flowers of *H. frondosum* rarely exceed 45 mm in diameter, and the diploid chromosome number is normally 18. One specimen in the Arnold Arboretum herbarium (A), however, has a flower 60 mm in diameter and is labelled as a tetraploid (2n = 36). It was collected from the Arboretum Trial Ground (*J.W. Peterson* J-196). Perhaps the extraordinarily large-flowered cv. Sunburst is also tetraploid. Colchicine-induced tetraploids of this species have been produced (Myers, 1963).

1x. **Hypericum frondosum × prolificum**

H. × *vanfleetii* Rehd., *Man. cult. trees*: 640 (1940) ['Van Fleetii']; W.P. Adams in *Rhodora* **74**: 281 (1972). Type: cultivated 1925 (at Arnold Arboretum, Jamaica Plain, Mass.?), not seen.

'Flowers 2.5–3 cm across, in terminal cymes, often with a few pairs of axillary solitary fl[owe]rs below' [Rehder].

Although the above species appear to remain distinct in the field, they hybridize in cultivation; and artificial hybrids between them have been made (Myers, 1963). There is a series of garden forms, intermediate in size of parts between *H. frondosum* and *H. prolificum* and with intermediate inflorescence forms, that breaks down the only differentiating character other than size. According to Adams, Rehder's description of *H.* × *vanfleetii* would apply to pure *H. frondosum*, whereas all specimens labelled *H.* × *vanfleetii* in the Arnold Arboretum Herbarium could easily be accommodated in *H. prolificum*. The use of the term 'cymes' by Rehder, however, suggests that these comprise more numerous flowers than is normal in *H. frondosum*; and the virtual restriction of the inflorescence to the terminal node is atypical of *H. prolificum*. One of Rehder's specimens, in my opinion, agrees with his description (*C.E.K. & C.K.A.* Arbor. 20895), but the other two, as Adams has said, are probably pure *H. prolificum*. None of these specimens is the type, as none has the date given by Rehder. In the absence of a definite type, or until one such is discovered, I therefore suggest that it is appropriate to use the specific epithet *vanfleetii* for those cultivated intermediates (and any wild ones that may occur), in the supposition that they are of hybrid origin (see also other Rehder hybrid names, pp. 100, 101).

2. **Hypericum prolificum** L., *Mant. pl.* **1**: 106 (1767); Lam., *Tab. encycl.* **2**: t. 643 f. 2 (1796), *Encycl.* **4**: 159 (1797); Pursh, *Fl. Amer. sept.* **2**: 375 (1814); Choisy, *Prodr. monogr. Hypéric.*: 46 (1821) pro parte excl. syn. *H. kalmianum* L., in DC., *Prodr.* **1**: 547 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 159 (1838) pro parte excl. syn. *H. densiflorum*; S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 128 (1878); Coulter in *Bot. Gaz.* **11**: 84 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 285 (1897); Sargent in *Gdn Forest* **3**: 525, f. 66 (1890); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Svenson in *Rhodora* **42**: 9 (1940); Rehd., *Man. cult. trees*, 2nd ed. 640 (1940); Fernald & Schubert in *Rhodora* **50**: 167, t. 1101 ff. 1–3 (1948); Svenson in *Rhodora* **54**: 205 (1952); W.P. Adams in *Rhodora* **61**: 250 (1959), in *Contr. Gray Herb. Harv.* no. 189: 15 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 69 (1973); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 755 (1960); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 712 (1968); Utech & Iltis in *Trans. Wis. Acad. Sci. Arts Lett.* **58**: 335 (1970); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 422 (1973); J.M. Gillett & Robson in *Publs Bot. natn. Mus. nat. Sci. Can.* no. 11: 9, t. 3, map 2 (1981); Cooperrider in *Castanea* **54**: 7, f. 1 (1989); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 67, ff. 10.1, 10.10 (1995). Type: U.S.A., without precise locality, *Herb. Linn.* 943/20 (LINN!-lectotype, Svenson, 1940). For discussions of Svenson's choice, see Fernald & Schubert (1948), Svenson (1952), Adams (1959, 1962) and Gillett & Robson (1981).

Fig. 14C, Map 2.

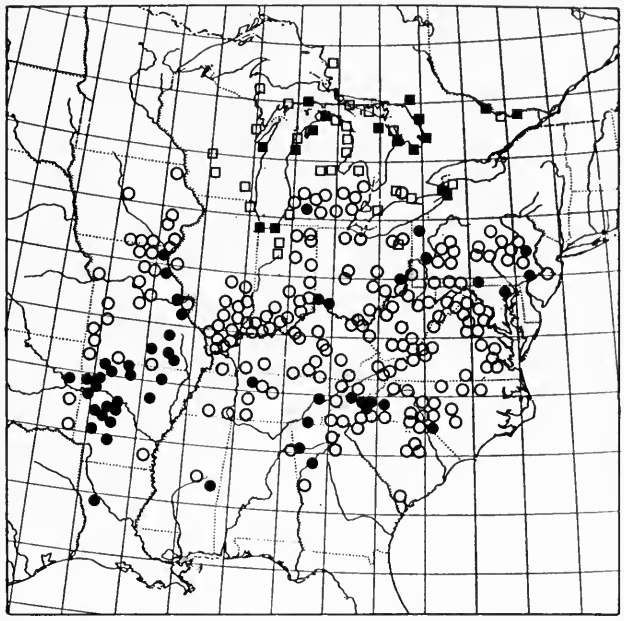
H. cryptopetalum Vogel in Trew, *Pl. rar.*, dec. **3**: 1, t. 21 f. 1 (1784), nom. illegit. (Art. 63). Type as for *H. prolificum* L.

H. foliosum sensu Jacq., *Pl. hort. schoenbr.* **3**: t. 299 (1798) pro parte quoad descr. et tab., non Aiton (1789).

Myriandra prolifica (L.) Spach, *Hist. nat. vég.* Phan. **5**: 439 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836); K. Koch, *Hort. dendrol.*: 66 (1853).

M. spathulata Spach in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836). Type: U.S.A., 'dans les provinces méridionales des États-Unis', *Leconte* s.n. (P-holotype).

M. ledifolia Spach, *Hist. nat. vég.* Phan. **5**: 441 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836). Type: U.S.A., Florida?, 'dans le midi États-Unis', *Leconte* s.n. (P!-holotype). Coulter (1886*a*) treated *M. ledifolia* as a synonym of *H. prolificum*, but, as Adams (1962: 50) pointed out, the description is not diagnostic; it could refer to



Map 2 Sect. 20: 2. *H. prolificum* ● specimens, ○ records; 3. *H. kalmianum* ■ specimens, □ records.

H. densiflorum. According to my own records, however, the specimen does belong to *H. prolificum*.

Hypericum spathulatum (Spach) Steud., *Nomencl.* 2nd ed. **1**: 789 (1840); Fernald & Schubert in *Rhodora* **50**: 168, t. 1101 f. 4 (1948); Fernald, *Gray's Man. Bot.* 8th ed.: 1011 (1950); J.P. Gillespie in *Castanea* **24**: 29 (1958); Mohlenbr., *Ill. Fl. Illinois fl. pls*, Hollies to Loasas: 37, t. 15 (1978).

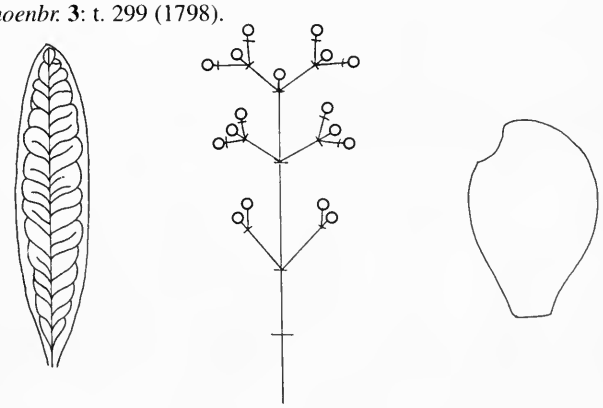
Myriandra prolifica [var.] γ *spathulata* (Spach) K. Koch, *Hort. dendrol.*: 66 (1853).

Brathys prolifica (L.) Payer, *Traité organogén. fl.* **8**: t. 1 (1857).

Hypericum kalmianum var. *majus* Gatt. in *Bot. Gaz.* **11**: 275 (1886), *Tennessee Fl.*: 29 (1887), nomen.

H. prolificum var. *montanum* Gatt., *Tennessee Fl.*: 29 (1887), nomen.

Icones: Sargent in *Gdn Forest* **3**: 524, f. 66 (1890); Jacquin, *Pl. hort. schoenbr.* **3**: t. 299 (1798).



Shrub (0.2–)0.75–1.5(–2) m tall, erect (or ± diffusely branched) with branches erect to ascending, forming rounded or irregular bush. *Stems* green, 4-lined and ancipitous when young, soon 4-lined and rounded, becoming reddish brown and terete in 2nd or 3rd season; cortex exfoliating in strips or flakes; bark pale grey, smooth, thin. *Leaves* sessile or rarely with pseudopetiole to 3(4–6) mm long, sometimes clustered; lamina 30–70 × 6–15 mm, narrowly oblong to narrowly elliptic-oblanceolate, plane? or with margin ± recurved, paler or somewhat glaucous beneath, deciduous at basal articulation, apex rounded-apiculate or rarely retuse to acute, base attenuate to narrowly cuneate (and then pseudopetiolate); venation usually clearly visible beneath: *c.* 10–16 pairs main laterals with subsidiaries and densely reticulate tertiaries, only midrib prominent; laminar glands dense. *Inflorescence* (1)3–7(–9)-flowered, rarely with paired accessory flowers, with paired single flowers or triads or 1–3(–7)-flowered branches from 2 nodes below, the whole broadly to narrowly cylindric; pedicels 1–2 mm long; bracts foliar or reduced, oblong-elliptic. *Flowers* 15–30 mm in diam.; buds broadly ovoid. *Sepals* 5, 4–8 × 1.5–4 mm, enlarging in fruit, imbricate, unequal to subequal, broadly or narrowly elliptic to obovate-spathulate or oblanceolate, obtuse or apiculate-obtuse to acute, plane or with margin recurved, basal veins 3–7, not or obscurely branching. *Petals* 5, golden yellow, becoming incurved-deflexed, 7–15 × 3–6 mm, 1.75–2 × sepals, obovate to oblanceolate-spathulate, with apiculus lateral, obtuse or apiculate-obtuse to acute. *Stamens c.* 150–500, longest 10–11 mm, 0.7–0.85 × petals. *Ovary* 3(4–5)-merous, (3–)4–5.5 × 1.2–3 mm, narrowly ovoid to narrowly ellipsoid, acute, placentation incompletely axile; styles 3(4–5), 4–6 mm long, 1–1.3 × ovary, remaining erect, separating slightly only as fruit matures. *Capsule* (6–)7–13 × 4–7 mm, narrowly ovoid-conic to ovoid or rarely ellipsoid, acute to subacute, trigonous to rounded, exceeding sepals, thickly to thinly coriaceous. *Seeds* blackish brown, 1.5–2 mm long, ecarinate; testa linear-reticulate to subscalariform. 2n = 18 (Nielsen, 1924; Adams in Robson & Adams, 1968).

Rocky slopes, embankments, dry river bottoms, open woodland (in north), usually on limestone but sometimes on granite; 90–over 600 m.

Eastern U.S.A., Canada (southern Ontario): north to Iowa, Michigan and New York, west to Missouri, Arkansas and Oklahoma, south to Mississippi, Alabama and Georgia.

CANADA. Ontario: near London (Gillett & Robson, 1981: map 2).

U.S.A. Alabama: *Madison Co., Huntsville, 1925, *Newsom* 8 (MO): Sumter Co., S. of Dancy, by Ala 17, 27 June 1970 (fl & fr), *Kral* 39768 (BM). Arkansas: Hot Spring Co., P.O. Malvern, Coastal Plain, Social Hill, 90 m, 4 July 1967 (fl), *Demaree* 56579 (BM); Montgomery Co., Ouachita R., South Fork, 210 m, 1 October 1962 (fr), *Demaree* 46619 (BM). District of Columbia: *High Island, 30 August 1905 (fr), *House* 1496 (MO). Georgia: Gordon Co.?, Costanaula R. below Resaca, 192 m, December 1903 (fr), *Harper* 2035 (MO); Heard Co., S. of Franklin, Camp Meeting Rock, 2 August 1958 (fl & fr), *Adams* 140 (K). Illinois: *Franklin Co., Big Muddy River Bottoms, Plumfield, 22 July 1941 (fl & fr), *McCree* 939 (MO); Johnson Co., Tunnel Hill, 15 May 1919 (fr), *Palmer* 15547 (MO). Indiana: *Crawford Co., *c.* 1.6 km NE of Leavenworth, *Deam* 18585 (*A, *IND); *Fulton Co., Tippecanoe R., 22 August 1926 (fl & fr), *Churchill* 573 (MO). Iowa: *Des Moines Co., Burlington, 7 August 1925 (fr). *Pammel* 765 (MO); *Lee Co., 1.8 km W. of Donnellson, 15 July 1928 (fl), *Shimek* s.n. (MO). Kentucky: *Bath Co., 5.6 km SW of Preston, 2 June 1938 (fr), *Wharton* 2474 (MO); ? Co., Kentucky R., Bronsborough, August 1934 (fl), *Peter* s.n. (K). Louisiana: Natchitoches, 16 June 1915 (fl), *Palmer* 8008 (K). Maryland: Cecil Co., Susquehanna River bottoms, 2 km S. of Conowingo, 18 July 1971 (fl), *Lombardo & Windler* 3622 (H); *Plymouth Co., Plymouth, 9 August 1884 (fl & fr), *Gray* s.n. (MO). Michigan: *St Clair Co., Port Huron, 21 July 1894 (fl), *Dodge* s.n. (MO); ? Co., Kalamazoo, n.d. (fl), *Hb. Carey* (K). Mississippi: one record (*fide* Adams). Missouri: Carter Co., Van Buren, 4 July 1914 (fl?), *Palmer* 6195 (K); Jefferson Co., Mammoth Creek, 10.5 km W. of De Soto, *c.* 170 m, 27 July 1895 (fl & fr), *P. & T. Raven* 16768 (BM, MO). New Jersey: Jersey, n.d. (fl), *Bartram* s.n. (BM). New York: *Cortland Co., Solon to Cincinnatus, 27 August 1916 (fr), *Wiegand* 6812 (MO). North Carolina: McDowell Co., Curtis Creek road *c.* 3 km S. of Blue Ridge Parkway, 25 July 1968 (fl), *Leonard & Radford* 1805 (BM, H); Richmond Co., 7.2 km NW of Buckingham, 5 October 1956 (fr), *Radford* 19158 (H). Ohio: Clermont Co., Loveland, 21 July 1878 (fl), *James* 269 (K); *Lucas Co., NW of Whitehorse, 19 October 1919 (fr), *Moseley* s.n. (MO). Oklahoma: Le Flore Co., W. end of Rich Mtn, Ouachita Nat. For., Page, 480 m, 23 October 1966 (fr), *Demaree* 53252 (BM); Logan Co., Strictland, 13 August 1937 (fr), *Demaree* 15752 (MO). Pennsylvania: Fayette Co., Ohio Pyle, 20

July 1902 (fl), *Shafer* 281 (BM); Northampton Co., Nazareth, 2 October 1849 (fr), *Prior* s.n. (K). South Carolina: Pickens Co., Table Rock, 1843 (fr), *Gray & Sullivant* s.n. (K). Tennessee: Polk Co., Hwy. 30, Reliance, 15 July 1969 (fl), *Rogers & Bowers* 43918 (H); Maury Co., above Duck R. by I-65, 18.7 km NNE of Lewisburg, 3 June 1971 (fr), *Kral* 43539 (BM). Virginia: ? Co., Chain Bridge, 7 October 1928 (fr), *Tanaka* 7262 (TAI); *Prince George Co., Flowerdew Hundred, 23 July 1938 (fl & fr), *Fernald & Long* 8769 (MO); Smyth Co., middle Holston Valley near Seven Mile Ford, 607 m, 1892? (fl), *Small* s.n. (K). Wisconsin (naturalized, see Utech & Iltis, 1970: 335, map 2): *Richland Co., 11.2 km W. of Boaz, 245 m, 6 August 1978 (fl & fr), *Nee* 16536 (MO).

CULTIVATED. Specimens seen from England (1842–1988), Ireland (1968–1971), Holland (n.d.), Germany (1732–1827), Switzerland (s.n.), France (1818–1890), Japan (1954–1955), China (1984), India (1956) and U.S.A. (1922–1979).

H. prolificum is the pivotal species in subsect. *Centrosperma*, linking 1. *H. frondosum* with 3. *H. kalmianum* and the *H. densiflorum* (Spp. 4–8), *H. nitidum* (Spp. 9–11) and *H. fasciculatum* (Spp. 12–14) groups respectively. *H. kalmianum* differs by the shorter habit and the restriction of the inflorescence to the terminal node, and usually by the 4–5-merous gynoecium and narrower leaves; and the other groups differ by the smaller flowers and (usually) fruits and usually narrower leaves. Most of them also have less intrusive placentae.

H. prolificum is very variable, the most primitive forms occurring in Arkansas and Oklahoma, i.e. on the other side of the Mississippi valley from the major area of *H. frondosum*. Thence it has apparently spread mainly northward and eastward round the north of the Mississippi Embayment to Iowa, Wisconsin, Michigan, New York and New Jersey and south to Mississippi, Alabama and Georgia. It is rare in the eastern Coast Plain and absent from, although (according to Adams, 1962: 15) hardy in, Massachusetts.

For hybrids with 1. *H. frondosum*, 3. *H. kalmianum*, 4. *H. lobocarpum* and 5. *H. densiflorum*, see discussions under these species respectively.

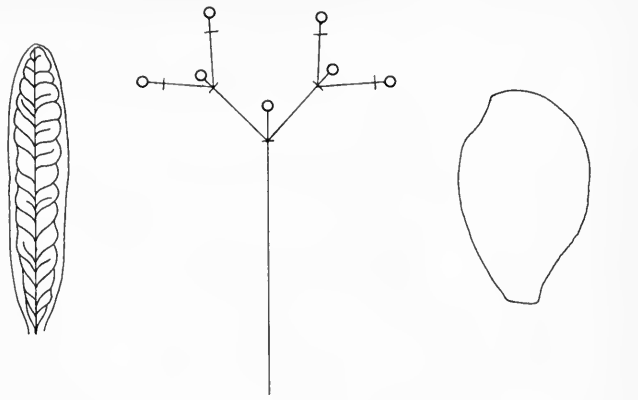
3. **Hypericum kalmianum** L., *Sp. pl.*: 783 (1753); Lam., *Encycl.* **4**: 148 (1797); Pursh, *Fl. Amer. sept.* **2**: 374 (1814); Choisy, *Prodr. monogr. Hypéric.*: 41 (1821) pro parte excl. syn. *H. bartramianum* Mill., in DC., *Prodr.* **1**: 545 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 158 (1838); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 127 (1878); Coulter in *Bot. Gaz.* **11**: 83 (1886), in A. Gray, *Syn. Fl. N. Amer.* **1**: 285 (1897); Sargent in *Gdn Forest* **3**: 113, f. 24 (1890); Sprague in *Curtis's bot. Mag.* **139**: t. 8491 (1913); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Svenson in *Rhodora* **42**: 9 (1940); Rehd., *Man. cult. trees* 2nd ed.: 639 (1940); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 12 (1962); Utech & Iltis in *Trans. Acad. Sci. Arts Lett.* **58**: 329 (1970); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 416 (1973); Mohlenbr., *Ill. Fl. Illinois fl. pls*, Hollies to Loasas: 29, f. 11 (1978); J.M. Gillett & Robson in *Publs Bot. natn. Mus. nat. Sci. Can.* no. 11: 7, t. 2, map 2 (1981); Cooperrider in *Castanea* **54**: 7, f. 1 (1989); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 67 (1995). Type: U.S.A., 'habitat in Virginia' (probably New York, near Niagara, see Gillett & Robson 1981: 9), *Kalm* in Herb. Linn. 943/2 (LINN-holotype; A, BM!-photographs).

Fig. 14B, Map 2.

Norysca kalmiana (L.) K. Koch, *Hort. dendrol.*: 66 (1853).

Icones: Sprague in *Curtis's bot. Mag.* **139**: t. 8491 (1913); Mohlenbr. *Ill. Fl. Illinois fl. pls*, Hollies to Loasas: 30, f. 11 (1978).

Shrub (0.14–)0.2–0.6(–1) m tall, erect, with branches erect to ascending, forming slender to rounded or flat-topped bush. *Stem* green, 4-lined and ancipitous when young, soon 4-lined and rounded, becoming reddish brown and terete in 2nd season; cortex exfoliating in strips; bark smooth, thin. *Leaves* sessile, sometimes



in immature clusters in leaf axils; lamina (15–)20–45 × 3–7(–10) mm, narrowly oblong to oblanceolate or linear, with margin subrecurved to revolute, paler or ± glaucous beneath, chartaceous, deciduous at basal articulation, apex rounded to obtuse or subapiculate-obtuse, base narrowly cuneate to subattenuate; venation rather obscure beneath: *c.* 9–14 pairs main laterals with subsidiaries and densely reticulate tertiaries, only midrib prominent; laminar glands dense. *Inflorescence* (1)3–7(rarely more)-flowered, without accessory flowers, restricted to terminal node or rarely also from 1–2 nodes below; pedicels 2.5–7 mm long; bracts reduced, linear-oblong to oblanceolate. *Flowers* 20–35 mm in diam.; buds broadly ovoid. *Sepals* 5(4), 4–9 × 1.5–5 mm, enlarging and divergent to reflexed in fruit, imbricate, subequal to unequal (when 4), elliptic or oblong to obovate, obtuse or apiculate to acute, margins recurved to revolute, basal veins 3–7, branching and reticulating distally. *Petals* 5(4), golden yellow, becoming incurved-deflexed, 8–15 × 5–9(–12) mm, 1.6–2 × sepals, obovate to oblong, with apiculus lateral, rounded or obsolete. *Stamens c.* 150–200, longest 6–10 mm, 0.65–0.75 × petals. *Ovary* (3–4)5(6)-merous, 4–6 × 1.5–2 mm, narrowly ovoid, acute; placentation incompletely axile; styles (3–4)5(6), 3–4 mm long, 0.65–0.75 × ovary, remaining erect, separating only as fruit matures. *Capsule* 7–11 × 4–7 mm, narrowly ovoid-conic to narrowly cylindric-ellipsoid, obtuse, rounded or slightly lobed, longer than sepals, thinly coriaceous. *Seeds* purplish brown, 0.7–1.1 mm long, shallowly carinate; testa subscalariform. 2n = 18 (Hoar & Haertl, 1932; Pringle, 1976).

Dunes and sandy or calcareous rocky shores, sandy or calcareous plains and low prairies, along rivers and in *Sphagnum*-sedge swamps; *c.* 180–400 m.

U.S.A. and Canada adjacent to the Great Lakes and along the Ottawa River. The record (var. *majus*) for Tennessee (Coulter, 1886*b*; Gattinger, 1887) is based on a mis-identification (see p. 97).

CANADA. Quebec: Pontiac Co., Plage Pontiac, 22 July 1942 (fl), *Baril* 2256 (BM); Pontiac Co., Bristol, 20 September 1938 (fr), *Marshall* s.n. (K). Ontario: Ottawa Distr., Carleton Co., March Township, Ottawa River N. of Shirley Bay, 14 August 1948 (fl), *Calder & Cody* 1583 (BM); Simcoe Co., Georgian Bay, Nottawasaga Bay, *c.* 1.6 km W. of Collingwood, 14 August 1974 (fl & e. fr), *Gillett* 16653 (H).

U.S.A. Illinois: Chicago, pre-1879 (fl), *Vasey* 182 (K); *Lake Co., Waukegan, *Gleason & Shobe* 331 (DUKE). Indiana: Lake Co., near Grand Calumet, Miller, 1 July 1934 (fl), *Buhl* F669 (TAI); *Starke Co., Bass Lake, *Deam* 20113 (IND). Michigan: Mason Co., Ludington, 20 May 1956 (o. fr), *Rolland-Germain* 6451 (K); Emmett Co., Wycamp Lake near Cross Village, 29 July 1933 (fl), *Gleason & Gleason* 261 (G, K). New York: Niagara Falls, Table Rock, n.d. (fl), *Gray* s.n. (K). Ohio: near Toledo, *fide* Adams (1959: map 1). Wisconsin: Door Co., Mud Bay, 24 May 1968 (st), *Borg* s.n. (H); *Juneau Co., N. of Mauston, 8 July 1936 (fl), *Fassett* 17928 (MO).

CULTIVATED. Specimens seen from England (1904–1967), Scotland (1977), Germany (1910), Japan (1930), Australia (1889) and the U.S.A. (1920–1974).

Despite its 5-merous ovary, *H. kalmianum* is clearly a northern derivative of *H. prolificum*, from which it differs in its shorter habit, its inflorescence usually being confined to the terminal node, and its usually 5-merous ovary. Adams (1962) thought that the presence of a 5-merous ovary in *H. kalmianum* and in 4. *H. lobocarpum* indicated that these species were closely related; but 5-mery in both species appears to be derivative. The fact that *H. kalmianum* is confined to once-glaciated areas (Utech & Iltis, 1970) supports the view that it is a relatively recent derivative of *H. prolificum*.

3x. Hypericum kalmianum × prolificum

Utech & Iltis (1970: 335) indicate that intermediates between *H. prolificum* and *H. kalmianum* may occur in Wisconsin, where *H. prolificum* is probably always an escape from cultivation. In gardens they seem to remain distinct; but it may be impossible to distinguish depauperate *H. prolificum* plants from true *H. kalmianum*. (For *H. kalmianum* × *densiflorum* see p. 102.)

4. **Hypericum lobocarpum** Gatt. in *Bot. Gaz.* **11**: 275 (1886), *Tennessee Fl.*: 29 (1887) ['*labocarpum*']; Sargent in *Gdn Forest* **10**: 453, f. 57 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Small, *Man. s.e. fl.*: 874 (1933); Rehd., *Man. cult. trees* 2nd ed.: 639 (1940); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 12 (1962), in *J. Elisha Mitchell scient. Soc.* **87**: 68 (1973); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed.: 411 (1973); Mohlenbr., *Ill. Fl. Illinois fl. pls*, Hollies to Loasas: 31, f. 12 (1978); Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 67 (1995). Types: U.S.A., Tennessee, Carroll Cr., Hollow Rock, August 1867 (fl & fr), *Gattinger* s.n. (F*-lectotype; GH*-isolectotype); loc. cit., 1886 (fl), *Gattinger* s.n. (F*, US*-syntype); 'W. Mississippi or Tennessee', 1863, *J.T. Stewart* (GH-syntype).

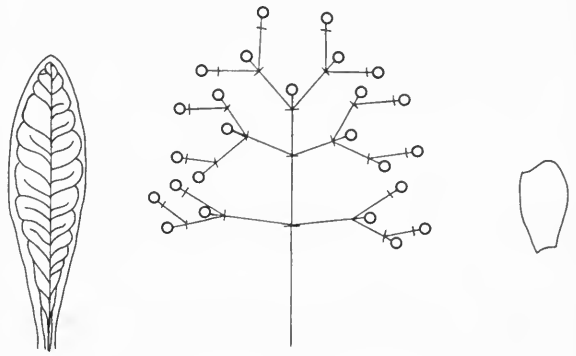
Map 3.

? *H. rostratum* Raf., *Fl. ludov.*: 88 (1817), *Herb. raf.*: 55 (1833), *New Fl.* **3**: 95 (1836) [1838]; Eaton, *Man. Bot.* 6th ed.: 135 (1833). Type: unknown. This species was described by C.C. Robin (1807) as related to *H. galioides*, and Rafinesque (1817) gave a Latin translation of Robin's French description. Svenson (1940) suggested that *H. rostratum* Raf. is probably an earlier name for *H. lobocarpum*, a suggestion with which I agree. Adams (1962: 50) also agreed; but he stated that, in the absence of a type, it should be rejected (as a nomen dubium) in the interests of nomenclatural stability. This would appear to be the sensible course to take, and I have therefore adopted the first undoubted name for this plant.

H. oklahomense E.J. Palmer in *J. Arnold Arbor.* **5**: 128 (1924); Rehd., *Man. cult. trees* 2nd ed.: 639 (1940). Type: U.S.A., Oklahoma, Le Flore Co., Page, 7 October 1922 (fr), *Palmer* 22228 (GH!-holotype; A!-isotype).

H. densiflorum var. *lobocarpum* (Gatt.) Svenson in *Rhodora* **42**: 11 (1940); Fernald, *Gray's Man. Bot.* 8th ed.: 1011 (1950); Gleason, *New Britton & Brown Ill. Fl.* **2**: 539 (1952); J.P. Gillespie in *Castanea* **24**: 29 (1958).

Icon: Sargent in *Gdn Forest* **10**: 453, f. 57 (1897).

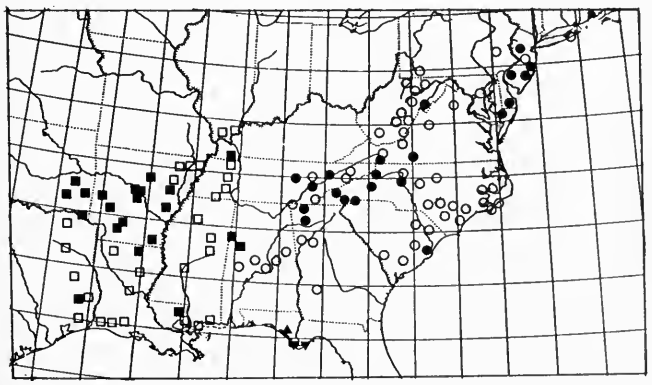


Shrub 0.9–1.5(–2) m tall, erect, with branches erect, forming large clumps. *Stems* reddish, 4-lined and ancipitous when young, soon 2-lined and rounded, becoming reddish brown and terete in 2nd season; cortex exfoliating in strips; bark smooth, thin. *Leaves* sessile or with pseudopetiole up to 5 mm long, often in axillary clusters; lamina 35–50 × 3–10(–14) mm, narrowly oblong to oblanceolate or linear, with margin recurved to revolute, paler or glaucous beneath, chartaceous, deciduous at basal articulation, apex apiculate-obtuse or apiculate-rounded to subacute, base narrowly cuneate to attenuate; venation obscure beneath: *c.* 12–14 pairs main laterals, with subsidiaries and densely reticulate tertiaries usually not or incompletely discernible, only midrib prominent; laminar glands dense. *Inflorescence c.* 5–25-flowered, without accessory flowers, with 3–15-flowered dichasia from 1–3 nodes below and sometimes flowering branches from lower nodes, the whole globose-cylindric to shortly and broadly pyramidal; pedicels 1.5–3 mm long; bracts reduced, elliptic to oblanceolate-spathulate or linear. *Flowers* 10–15 mm in diam.; buds broadly ovoid to subglobose. *Sepals* 5, (3.5–)4–4.5 × 0.8–1.5(–2) mm, subequal to equal, not enlarging but divergent to reflexed in fruit, ± narrowly elliptic to narrowly oblong or oblanceolate-spathulate, apiculate to acute, margins revolute, basal veins 3–7, branching distally. *Petals* 5, golden yellow, becoming incurved-deflexed, 6–7(–8) × 2.5–3.5 mm, obovate-oblanceolate with apiculus lateral, acute. *Stamens c.* 100–150, longest 5–6.5 mm, 0.8–0.85 × petals. *Ovary* (3)4–5-merous, 2.5–3.5 × 1–1.5 mm, narrowly ovoid, acute; placentation incompletely axile; styles (3)4–5, 2–3 mm long, 0.8–0.85 × ovary, remaining erect, separating only as fruit matures. *Capsule* 5.5–7 × 2.5–3.5 mm, narrowly ovoid-conic to ovoid, acute to subacute, (3)4–5-lobed, exceeding sepals, thinly coriaceous. *Seeds* blackish brown, 1.2–1.5 mm long, not carinate; testa linear-reticulate. 2n = 18 (n = 9) (Hoar & Haertl, 1932).

Rocky river bottoms and banks, lake margins, swamps and open *Pinus* woods; lowland up to *c.* 500 m.

South-eastern U.S.A. from south-eastern Oklahoma and eastern Texas to southern Illinois, western Kentucky, eastern Alabama and southern S. Carolina.

U.S.A. Alabama: Sumter Co., by Ala. 28, 1.2 km SE of Coatopa, 2 August 1971 (fl), *Kral* 43498 (BM, MO). Arkansas: Montgomery Co., P.O. Mt Ida, 225 m, 5 July 1962 (fl), *Demaree* 45843 (BM); *Pulaski Co., Pulaski Heights, Little Rock, *Demaree* 8207 (A, BKL, GH, NY). Illinois: Massac Co., near Brookport, 28 July 1960, *Swayne* 1104 (*fide* Mohlenbrock & Voigt, 1959: 242). Kentucky: *Calloway Co., between Murray and near Concord,



Map 3 Sect. 20: 4. *H. lobocarpum* ■ specimens, □ records; 5. *H. densiflorum* ● specimens, ○ records; 12. *H. lissophloeus* ▲; 14. *H. chapmanii* ▼.

Smith & Hodgdon 4083 (GH, US); *Calloway Co., on State Line Rd. of KY 121s, 25 June 1974 (fl), *Athey* 2834 (MO). Louisiana: Morehouse Par., N. side of Irvine Lake, *c.* 2.4 km S. of Arkansas Line NW of Beekman and *c.* 0.8 km W. of La. 142, 17 July 1986 (fl & fr), *Dale Thomas* 97418 (BM); Webster Par., 6.4 km W. of Minden, *Correll & Correll* 10310 (DUKE, F, GA, MO, NY, PH). Mississippi: *Hancock Co., 14 June 1939 (fl), *Woodson & Schery* 57 (MO); *Oktibbeha Co., 9.6 km W. of Starkville, *Ray* 8698 (MISSA). Oklahoma: Latimer Co., SE of Damon, 11 August 1930 (fl), *Clark* 3214 (BM); McCurtain Co., Isabel, 22 July 1915 (fl), *Palmer* 8082 (K). South Carolina: Allendale Co., on 5–3–26 9.7 km S. of junction with US 301, 0.5 km W. of junction with 5–3–43, 8 September 1967 (fl & fr), *Bozeman, Radford & Radford* 11419 (BM, H). Tennessee: Chester Co., June 1892 (fl), *Bain* s.n. (MO, Z); Corrall Co., near Hollow Rock, 13 August 1897 (fr), *Herb. Biltmore* 3989 (BM, H, K, MO, Z). Texas: Hardin Co., 1.6–1.2 km NE of Batson, 13 November 1945 (fr), *Cory* 50764 (NY).

CULTIVATED. Specimens seen from the U.S.A. (1899–1920). Also cultivated in Europe (Chittenden, 1951: 1036).

The status of 4. *H. lobocarpum* in relation to 5. *H. densiflorum* has been debated. Gattinger originally described it as a species, but Svenson (1940), when reducing it to varietal status under *H. densiflorum*, pointed out that the two taxa could not be separated on leaf width or habitat and that the numbers of styles and capsule valves were only relatively different. Adams (1962), on the other hand, while agreeing that style number was not diagnostic, reported that 92.1 % of his *H. densiflorum* sample had a 3-merous ovary, whereas 79.1% of his *H. lobocarpum* ovaries were 5-merous and a further 19.2% were 4-merous, i.e. 98.3% were 4- or 5-merous. Taken in conjunction with their apparently distinct distributions (separated by 240 km in Mississippi/Alabama) and difference in capsule lobing, these differences appeared to warrant recognition of these taxa as species.

Recent collections have included specimens of undoubted *H. lobocarpum* from western Alabama and S. Carolina (see above), although Adams (1973) did express doubt about the identity of the S. Carolina population; and other specimens from Alabama tend to have some intermediate characters (e.g. *Kral* 43501 (BM) from Marengo Co., W. of Demopolis). Nevertheless the geographical variation trends in each taxon are suggestive of original total separation and later introgression rather than incomplete separation. If this is so, then the Alabama intermediates should be regarded as hybrids. At any rate, it seems best to maintain these taxa as species, at least until a field analysis of the Alabama populations is made.

4x. **Hypericum lobocarpum × prolificum**

H. × *dawsonianum* Rehd. in *Mitt. dt. dendrol. Ges.* **19**: 253 (1910); W.P. Adams in *Rhodora* **72**: 279 (1972). Type: cultivated in U.S.A., Massachusetts, Jamaica Plain, Arnold Arboretum, 9 October 1910 (fl), *Rehder* s.n. (A!-lectotype).

Plants grown from seed of *H. prolificum* were found by Rehder to have 3–5-valved lobed capsules and a multiflowered corymbose inflorescence. Adams (1972) agreed that these plants were likely to be hybrids with *H. lobocarpum* and suggested that they arose spontaneously in the garden; and, having examined the Arnold Arboretum specimens, I too agree with their suggested parentage. Adams also reported field specimens intermediate between these species from southern Missouri.

5. **Hypericum densiflorum** Pursh, *Fl. Amer. sept.* **2**: 376 (1814); Choisy, *Prodr. monogr. Hypéric.*: 45 (1821), in DC., *Prodr.* **1**: 547 (1824); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 125 (1878); Coulter in *Bot. Gaz.* **11**: 84 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 285 (1897) pro parte, excl. syn. *Myriandra spathulata* Spach; Sargent in *Gdn Forest* **3**: 525, f. 67 (1890); Svenson in *Rhodora* **42**: 10 (1940); Rehd., *Man. cult. trees* 2nd ed.: 640 (1940); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 756 (1960); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 14 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 69 (1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 712 (1968); Utech & Iltis in *Trans. Wis. Acad. Sci. Arts Lett.* **58**: 333, f. 3 (1970); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 411 (1973); Mohlenbr., *Ill. Fl. Illinois fl. pls*, Hollies to Loasas: 37, f. 16 (1978); Godfrey & Wooten, *Aquatic & wetland pls of s.e. U.S.*, Dicots: 346, f. 157 (1981); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 67, ff. 10.1, 10.11 (1995). Type: U.S.A., Virginia, on the dry ridges and savannahs of the Virginia mountains, *Pursh* s.n. (OXF?-holotype) – see Svenson (1940). Map 3.

H. prolificum sensu Torrey & Gray, *Fl. N. Amer.* **1**: 159 (1838) pro parte quoad syn. *H. densiflorum* Pursh.

H. rosmarinifolium sensu Torrey & Gray, *Fl. N. Amer.* **1**: 159 (1838); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); non Lam. (1797).

H. prolificum var. *densiflorum* (Pursh) A. Gray, *Manual* 2nd ed.: 50 (1856).

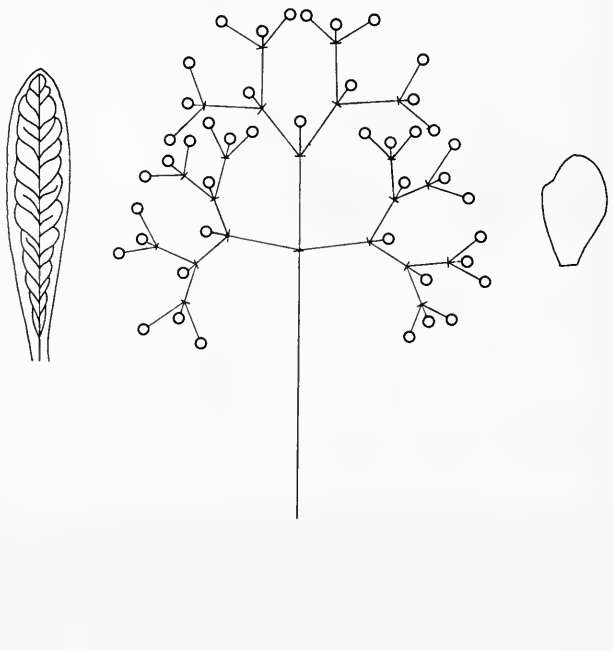
H. glomeratum Small in *Bull. N. Y. bot. Gdn* **1**: 281 (1899) pro parte quoad typum, *Man. s.e. fl.*: 87 (1933). Type: U.S.A., North Carolina, Watauga Co., Grandfather Mtn, August 1896 (fr), *Huger* s.n. (NY-holotype).

H. interior Small in *Bull. Torrey bot. Club* **28**: 359 (1901). Type: U.S.A., Tennessee, Jefferson Co., prope Dandridge, July 1842 (fl), *Rugel* 154 (NY-holotype; BM!, G!, K!, W!-isotypes).

H. nothum Rehd. in *Mitt. dt. dendrol. Ges.* **19**: 254 (1910) qua hybr., *Man. cult. trees* 2nd ed.: 639 (1940); W.P. Adams in *Rhodora* **74**: 280 (1972); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 416 (1973). Type: cultivated in U.S.A., Massachusetts, Jamaica Plain, Arnold Arboretum, 10 October 1910 (fr), *Rehder* s.n. (A!-lectotype, selected here). Rehder interpreted his specimens as hybrid (*H. densiflorum* × *kalmianum*) on account of the occurrence of a few 4- or 5-styled capsules among the predominantly 3-styled ones. Despite these, however, as Adams pointed out, the specimens can readily be assigned to *H. densiflorum*.

H. revolutum R. Keller in *Bot. Jb.* **58**: 194 (1923), in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); non Vahl (1790). Type: U.S.A., Georgia, Whitfield Co., Spring Creek near Sarnell, 225 m, 21 December 1903 (fr), *Harper* 2032 (B†-holotype; F!, GH!, NY-isotypes).

Icones: Sargent in *Gdn Forest* **3**: 527, f. 67 (1890); Mohlenbr., *Ill. Fl. Illinois fl. pls,* Hollies to Loasas: 39, f. 16 (1978).



Shrub 0.6–3 m tall, erect, with branches ± erect, rather stiff, numerous, forming rather slender bush, but with adventitous shoots from roots sometimes producing ± extensive thickets. *Stems* green to reddish, 4-lined and ancipitous when young, soon 2-lined and rounded, becoming reddish brown and terete in 2nd season; cortex exfoliating in strips; bark smooth, thin. *Leaves* sessile, sometimes in immature clusters in leaf axils; lamina 20–45 × 2–7 mm, very narrowly elliptic-oblong or oblanceolate to linear, with margin recurved to revolute, paler and often glaucous beneath, chartaceous, deciduous at basal articulation, apex apiculate or apiculate-obtuse to subacute, base narrowly cuneate to attenuate; venation sometimes obscure beneath: *c.* 14–17 pairs main laterals, with subsidiaries and tertiary reticulation sometimes visible, only midrib prominent; laminar glands dense. *Inflorescence c.* 5–25-flowered, without accessory flowers, with (2–)5–15-flowered dichasia from 1–2 nodes below and sometimes flowering branches from lower nodes, the whole broadly pyramidal to broadly cylindric or obpyramidal; pedicels 0.5–5 mm long; bracts reduced, oblanceolate-spathulate to linear. *Flowers* 10–17(–20?) mm in diam.; buds broadly ovoid-ellipsoid. *Sepals* 5, (4–)4.5–6 × 1–1.5 mm, unequal or subequal, not enlarging but divergent to reflexed in fruit, narrowly oblong-lanceolate or narrowly oblong to oblanceolate-spathulate, subacute or apiculate to acute, margins revolute, basal veins 1–3, the laterals sometimes branched. *Petals* 5, deep golden yellow, becoming (incurved-) deflexed, 6–9 × 2.5–3.5 mm, obovate-oblanceolate with apiculus lateral, acute. *Stamens c.* 100–150, longest 4.5–7 mm, *c.* 0.8 × petals. *Ovary* 3–4(–5)-merous, 3–3.5 × 1–1.3 mm, narrowly pyramidal-ovoid, acute; placentation incompletely axile; styles 3–4(5), 2–3 mm long, 0.7–0.85 × ovary, remaining erect, separating only as fruit matures. *Capsule* 5–6(–7) × 2–3 mm, narrowly ovoid-conic or narrowly ovoid to cylindric-ovoid, acute, not or scarcely lobed, exceeding sepals, thinly coriaceous. *Seeds* reddish brown, 0.8–1.3 mm long, not carinate; testa linear-reticulate. 2n = 18 (n = 9) (Adams in Robson & Adams, 1968). Adams also reported 2n = 27 (n = 11–14) in one population due to unequal segregation (Adams, 1959)

Wet or moist habitats (meadows, lake margins, open stream banks, pinelands, bogs, ditches), also on dry road embankments and rocky hillsides; lowland to *c.* 1000 m.

Eastern U.S.A. from central Georgia northward along the coastal plain to New Jersey and thence southwestward along the Appalachian Mts from Pennsylvania to northern Georgia and central Alabama.

U.S.A. Alabama: *Jefferson Co., Shade's Mt. near Birmingham, *Leeds* 2140 (PH); Tuscaloosa Co. (see Adams, 1962). Delaware: Sussex Co., Seaford, Nauticoke R., 31 August 1882 (fr), *Commons* s.n. (K). Georgia: Bartow Co., Rydal, N. of Cartersville, 11 July 1958 (fl), *Adams* 77 (K, MO); *Catoosa Co., east-flowing tributary to Chickamauga Creek, 5 km NE of Ringgold, 240 m, 26 June 1948 (fl), *Cronquist* 5390 (MO). Maryland: Wiscomico Co., Salisbury, June pre-1890 (fl & fr), *Canby* s.n. (K). New Jersey: Burlington Co., 3.2 km W. of Warren Grove, 18 June 1948 (fl), *Lawrence & Dress* 264 (BM); Ocean Co., Bayville, 31 August 1937 (fl & fr), *Moldenke* 10163 (BM). New York: ? Co., Long Island, *fide* Adams (1959: map 6). North Carolina: Avery Co., 6.2 km W. of Allegany Co. line on NC 88, 30 July 1979 (fl & fr), *Leonard & Russ* 2644 (BM, H); Macon Co., Highlands, 6th Street, 31 July 1975 (fl), *Bouffon & Wood* 1775 (H, MO). Pennsylvania: Fagette Co., Ohiopyle, 15 October 1933, *Jennings* s.n. (CA). South Carolina: Georgetown Co., 8 km W. of Georgetown, 3 August 1939 (fl), *Godfrey* in *Pl. Exs. of Gray* 1371 (BM, K). Tennessee: Knox Co., Big Ridge State Park, 4 July 1954 (fl), *Norris* 18622 (BM); Rhea Co., near Watts Bar Dam, 25 June 1947 (fl), *Shanks, Sharp & Clebsch* 4197 (BM). Virginia: ? Co., Tygart's valley river, 1843 (fl & fr), *Gray & Sullivant* s.n. (K); Grayson Co., Blue Ridge Parkway, 0.5 km N. of Route 89, 19 July 1958 (fl), *Adams* 109 (K, NCU*). West Virginia: Randolph Co., below Elkins, 24 August 1907 (fl), *Rehder* s.n. (K, MO); *Webster Co., Camp Caesar near Cowen, 18 June 1936 (fl), *Williams* 490 (BKL, DUKE, F, MO, PH, SMU, TENN, US, WVA).

Despite the existence of some intermediate populations, it seems best to maintain 5. *H. densiflorum* as specifically distinct from 4. *H. lobocarpum* (q.v.). *H. densiflorum* usually has a trimerous ovary, but 4- or 5-merous ovaries may also be present on the same plant. The capsule is usually but not always unlobed. However, except for members of the intermediate Alabama populations, it is nearly always possible to allocate a specimen to one or other species.

Whereas the southwesternmost (Alabama) populations of *H. densiflorum* verge morphologically towards *H. lobocarpum*, some in Tennessee and northern Georgia with narrow leaves and narrow, small-flowered inflorescences (*H. interior* Small) tend towards *H. galioides*. *H. densiflorum* is apparently always distinguishable in the wild from 2. *H. prolificum* by the smaller, more numerous flowers amd fruits in a shorter and relatively broader inflorescence. In cultivation, however, these distinctions may be far less clear (see below).

Adams (1973) reported evidence of poor seed production in some populations, a condition that, he suggested, might be correlated with the occurrence of triploidy (see above).

5x. **Hypericum densiflorum × galioides?**

H. × *arnoldianum* Rehd. in *Mitt. dt. dendrol. Ges.* **19**: 253 (1910); W.P. Adams in *Rhodora* **74**: 276 (1972). Type: cultivated in U.S.A., Massachusetts, Jamaica Plain, Arnold Arboretum, 9 October 1910 (fr), *Rehder* (A!-lectotype, selected here).

Rehder's belief that the parentage of this hybrid was *H. galioides* × *lobocarpum* was not substantiated by Adams (1972), who found only a few well-formed seeds in each fruit. He argued that, whilst the partially lobed fruit and the 16 per cent of fruits with 4 styles indicated that *H. lobocarpum* was one parent, there were no characters of *H. galioides* present. On the other hand, characters of the Tennessee populations of *H. densiflorum* were present; and so he suggested that the most likely parentage of *H.* × *arnoldianum* was *H. densiflorum* × *lobocarpum*. Support for this hypothesis had been provided earlier by Hoar & Haertl (1932), who reported 'no irregularity in chromosome behaviour nor morphological sterility of pollen' when recording the chromosome number n = 9, and concluded that this hybrid 'apparently came from compatible parents' (which *H. densiflorum* and *H. lobocarpum* almost certainly would be).

On the other hand, Rehder's original plants came 'from seed of *H. galioides*' (specimen 9 x 1910). Adams suggested that Rehder might have misidentified the relevant specimen(s) of *H. galioides*; and since the above-mentioned Tennessee population of *H. densiflorum* is morphologically the most similar part of that species to *H. galioides*, he may well be right. After an examination of Rehder's specimens, however, I cannot be sure that *H. galioides* is not involved; and specimens grown subsequently at the Arnold Arboretum from plants obtained from Cole Nursery, Painesville, Ohio (AA 856–38 (MO)) look like *H. densiflorum* (or possibly *H. lobocarpum*) except for a narrower, more elongated inflorescence (from 3 nodes) that is reminiscent of that of *H. galioides*.

5xx. **Hypericum densiflorum × prolificum**

In gardens, at least in the British Isles, it is not always easy to decide whether a plant belongs to one or the other of the above two species. If the specimen has small flowers and relatively narrow leaves but the inflorescence of *H. prolificum*, then it can probably be regarded as an impoverished example of that species (cf. *H. foliosum* sensu Jacquin, *Pl. hort. schoenbr.* **3**: t. 299, 1798). If it has a shorter, broader inflorescence and smaller leaves than those of *H. prolificum*, and hybridization with *H. frondosum* or *H. kalmianum* can be ruled

out, then it could quite possibly be the hybrid *H. densiflorum* × *prolificum*. A low (*c.* 0.4–0.6 m tall) compact shrub grown in British gardens as *H.* × *arnoldianum* could belong here but is more likely to be *H. densiflorum* × *lobocarpum* or even *H. densiflorum* × *kalmianum* (the alleged parentage of *H. nothum* Rehder).

6. **Hypericum galioides** Lam., *Encycl.* **4**: 16 (1797); Willd., *Sp. pl.* **3**: 1451 (1802); Pursh, *Fl. Amer. sept.* **2**: 376 (1814); Elliott, *Sketch bot. S. Carolina* **2**: 28 (1821); Choisy, *Prodr. monogr. Hypéric.*: 52 (1821), in DC., *Prodr.* **1**: 550 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 159 (1838); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 126 (1878); Coulter in *Bot. Gaz.* **11**: 85 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 286 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Svenson in *Rhodora* **42**: 12, t. 587 f. 3 (1940) pro parte, quoad var. *typicum*; Rehder, *Man. cult. trees & shrubs* 2nd ed.: 639 (1940); Gillespie in *Castanea* **24**: 29 (1958); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 757 (1960); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 171 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 69 (1973); Correll & Johnston, *Man. vasc. pls. Texas*: 1063 (1970); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); R. Long & Lakela, *Fl. Trop. Florida*: 607 (1971); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 414 (1973); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.*, Dicots: 346, f. 156 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 368, f. 177 (1988); N. Robson in *Eur. Gdn Fl.* **4**: 69 (1995). Type: U.S.A., S. Carolina ('Carol. merid.'), no precise locality, *Fraser* (P-LA-holotype, BM!-microfiche; G-DC!-isotype; GH-sketch). Svenson (1940: 13) stated that this collection is apparently identical with several from near Wilmington, N. Carolina, although 'merid.' implies S. Carolina.

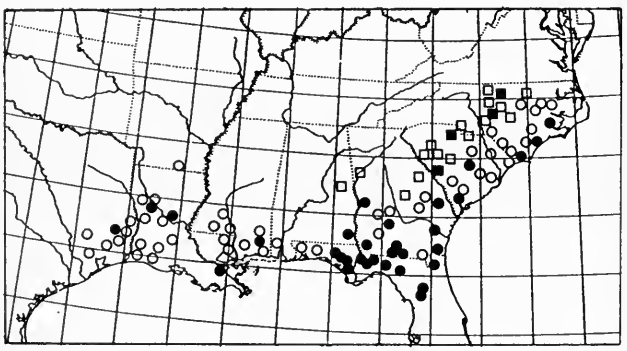
Fig. 15A, Map 4.

H. axillare Lam., *Encycl.* **4**: 161 (1797). Type: U.S.A., no precise locality, *?* 'in Herb. D. de Jussieu' (P-holotype, BM!-microfiche; GH*-isotype). The specimen labelled as *H. axillare* in the microfiche series of the de Jussieu herbarium appears to be *H. prolificum*. The GH isotype is a fragment (*fide* Adams, 1962).

H. triplinerve Vent., *Desc. pl. nouv.*: 58 & t. (1800); Pursh, *Fl. Amer. sept.*: 378 (1814). Type: U.S.A., cult. ex 'sur les bords de l'Ohio', n.d. (fl & fr), *Michaux* s.n. (G-holotype). The locality cited by Ventenat is well outside the present distribution of *H. galioides* and must surely be an error.

H. fasciculatum Michx. ex Willd., *Sp. pl.* **3**: 1452 (1802); Michx., *Fl. bor.-amer.* **2**: 80 (1803); non Lam. (1797). Type: U.S.A., Carolina, *Michaux*? s.n. (P-holotype, BM!-microfiche).

H. michauxii Poir., *Encycl.*, Suppl. **3**: 696 (1813). Type as for *H. fasciculatum* Michx. ex Willd., non Lam.



Map 4 Sect. 20: 6. *H. galioides* ● specimens, ○ records; 8. *H. lloydii* ■ specimens, □ records.

H. fasciculatum [var.] β sensu Choisy, *Prodr. monogr. Hypéric.*: 59 (1821) pro parte, quoad syn.

H. ambiguum Elliott, *Sketch bot. S. Carolina* **2**: 30 (1821); Torrey & Gray, *Fl. N. Amer.* **1**: 62 (1838); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Small, *Man. s.e. fl.*: 871 (1933). Type: U.S.A., S. Carolina, near Columbia, *Elliott* s.n. (CHARL-holotype).

H. rosmarinifolium? sensu Elliott, *Sketch bot. S. Carolina* **2**: 29 (1821), non *H. rosmarinifolium* Lam. (1797).

Myriandra galioides (Lam.) Spach, *Hist. nat. vég.* Phan. **5**: 437 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836); K. Koch, *Hort. dendrol.*: 66 (1853).

M. michauxii (Poir.) Spach, *Hist. nat. vég.* Phan. **5**: 437 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836).

M. prolifica [var]. β *ramosa* K. Koch, *Hort. dendrol.*: 66 (1853). Type as for '*H. galioides* Pursh', i.e. *H. galioides* Lam.

Brathydium ambiguum (Elliott) K. Koch, *Hort. dendrol.*: 66 (1853).

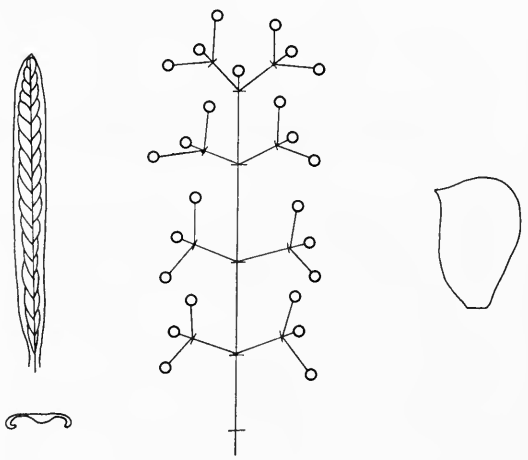
Hypericum galioides var. *ambiguum* (Elliott) Chapm., *Fl. South. U. S.*: 40 (1865); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 127 (1878). Type: Chapman cites '*H. ambiguum* Ell.? Torrey & Gray', but Torrey & Gray (1838) do not mention var. *ambiguum*, Chapman's name must therefore have Elliott's type.

H. galioides var. *axillare* (Lam.) Griseb., *Cat. pl. Cub.*: 39 (1866) pro parte, quoad typum.

H. galioides [var.] *pallidum* Mohr in *Contr. U. S. natn. Herb.* **6**: 621 (1901); Lott in *J. Arnold Arbor.* **19**: 149 (1938); Svenson in *Rhodora* **42**: 14, t. 587 f. 4 (1940), nom. illegit. (Art. 63). Type as for '*H. galioides* var. *ambiguum* Chapman non *ambiguum* Elliott'; but the type nevertheless is that of Elliott, see above.

H. spathulatum R. Keller in *Bot. Jb.* **58**: 195 (1925), in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **2**: 180 (1925), non (Spach) Steud. (1840). Type: U.S.A., Georgia, Lee Co., Flint R., Muckalee Swamp, 11 July 1901 (fr), *Harper* 1155 (B†-holotype; A!, BM!, GH*, NY*, US!-isotypes).

Icones: Bean in *Gdnrs Chron.* III, **24**: 301, f. 88 (1898); Godfrey & Wooten, *Aquatic & wetland pls s.e. U. S.*, Dicots: 347, f. 156 (1981).



Shrub 0.5–1.5 m tall, erect, with branches strict to ascending, forming rounded clumps. *Stems* stramineous to reddish, 6-lined and ancipitous when young, soon 4-lined and rounded, then terete; cortex exfoliating in small roughish flakes to reveal fine lattice of laticifers; bark smooth, thin. *Leaves* sessile or apparently pseudopetiolate, with those in axillary immature clusters sometimes almost as large; lamina 15–32(–37) × 1–7 mm, very narrowly oblong-elliptic or oblanceolate to linear, with margin recurved to revolute, paler but not glaucous beneath with lamina visible on both

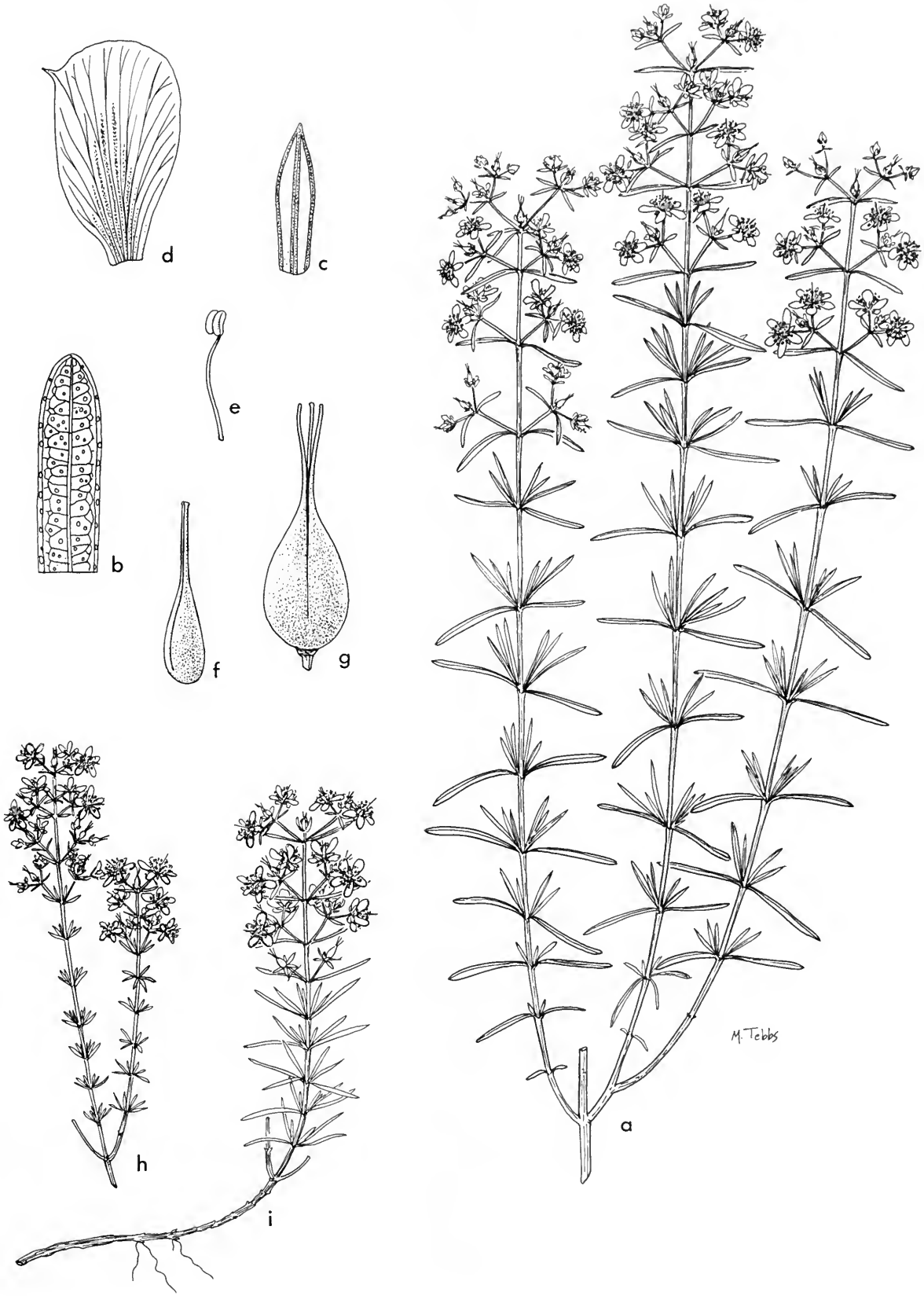


Fig. 15 A. *H. galioides*: (a) habit; (b) leaf (upper half); (c) sepal; (d) petal; (e) stamen; (f) ovary; (g) fruit. B. *H. tenuifolium*: (h) habit. C. *H. lloydii:* (i) habit (a, h, i × ½: b × 3: c-g × 4). A. *Rugel* 495. B. *Herb. Biltmore* 2563a. C. *Eggert* s.n.

sides of midrib, chartaceous, deciduous at basal articulation, apex rounded or apiculate-obtuse to acute, base attenuate; venation (sometimes obscure): numerous main laterals and subsidiaries, with tertiary reticulation often visible, only midrib prominent; laminar glands dense; inframarginal glands dense. *Inflo*rescence 3–*c.* 15-flowered, without accessory flowers, with (1)3–5-flowered dichasia from 3–4 nodes below and often flowering branches from lower nodes, the whole narrowly cylindric; pedicels 0.5–1 mm long; bracts somewhat reduced, foliar. *Flowers* 9–14 mm in diam.; buds narrowly ovoid. *Sepals* 5, 3.5–6.5 × 0.5–1.5 mm, subequal to equal, not enlarging or spreading in fruit, oblanceolate-spathulate to linear, acute to apiculate-obtuse, 1-veined, deciduous. *Petals* 5, bright yellow, becoming somewhat deflexed, 5–9 × 2–5.5 mm, obovate-oblanceolate with apiculus lateral, acute. *Stamens c.* 60–120, longest 3.5–7 mm, *c.* 0.65 × petals. *Ovary* 3-merous, 2–3 × 0.5–1 mm, very narrowly pyramidal-ovoid, acute; placentation parietal; styles 3, 4–5 mm long, 1.2–1.35 × ovary, remaining erect, separating only as fruit matures. *Capsule* 4.5–6 × 2.5–3.5 mm, ± narrowly ovoid-conic, shorter than sepals, thinly coriaceous. *Seeds* dark brown, 0.7–0.8 mm long, carinate?; testa finely reticulate. 2n = 18 (n = 9) (Adams in Robson & Adams, 1968).

Wet or moist, open habitats (stream banks, swamps, river bottoms, flood plains, lake margins, roadside ditches, low pine forest); coastal plain, below 200 m.

South-eastern U.S.A. from North Carolina to northern Florida and west to eastern Texas, excluding most of the Mississippi delta.

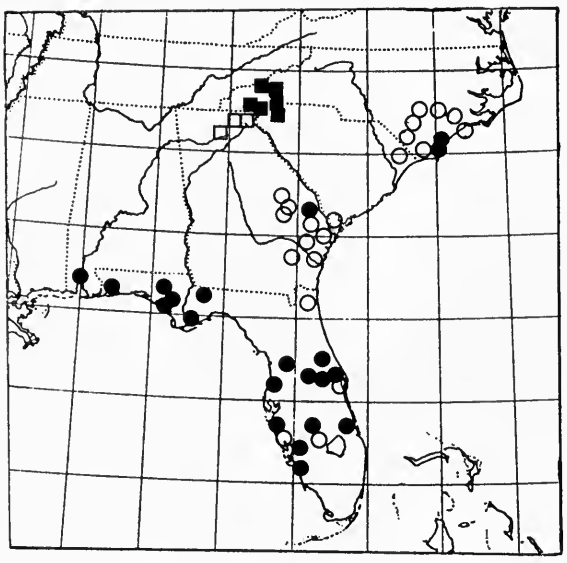
U.S.A. Alabama: *Covington Co., *c.* 11.2 km SSE of Carolina, by co.e 31, 3 October 1971 (fr), *Kral* 44760 (MO); Houston Co., Indigo Pond SE of Cottonwood, 1 August 1971 (fr), *Kral* 43399 (BM). Arkansas: Union Co., E. of Strong, 7.5 km W. of Ouachita R., Felsenthal Nat. Wildlife Refuge, 22 October 1987 (fr), *Dale Thomas* 103014 (MO). Florida: Columbia Co., Lake City, 11–19 July 1895 (fl), *Nash* 2190 (K); Gulf Co., shores of Dead Lake near Wewahitchka, 3 September 1958 (fr), *Godfrey* 57585 (BM, FSU*). Georgia: Lowndes Co., E. side of Little River, *c.* 8 km W. of Hahira, 19 June 1958 (fl), *Adams* 50 (K); Dooly Co., bank of Flint R., 57 m, 11 July 1901 (fl), *Harper* 1061 (BM). Louisiana: *Calcasieu Par., L. Charles, 10 September 1898 (fr), *McKenzie* 517 (MO); New Orleans, 1832 (fr), *Drummond* 50 (BM, K); Natchitoches Par., 25 May 1941 (fl), *Keefe* s.n. (H). Mississippi: Perry Co., outskirts of Beaumont, 16 July 1950, *Webster & Wilbur* 3409 (G); * ? Co., lower Pearl River, May 1859 (fl), *Hilgard* s.n. (MO). North Carolina: Columbus Co., Co. Rt. 1928 SE of Old Dock near Juniper Creek, 11 July 1968 (fl), *Leonard* 1754 (BM, H, Z); Pender Co., N. of Burgaw, near U.S. 117, 23 July 1966 (fl), *Bradley* 3333 (BM, H). South Carolina: Colleton Co., 8 km W. of junction of SC64 and SC641, 14 July 1958 (fl), *Adams* 89 (K); *Williamsburg Co., 8 km S. of Kingstree, 10 July 1959 (fl), *Godfrey & Tryon* 383 (MO). Texas: Hardin Co., 16 km SE of Votaw, 23 July 1978 (fl), *Fryxell* 3015 (BM); *Harris Co., Sheldon, 1903 (fl & fr), *Reverchon* 3828 (MO).

The leaves of *H. galioides* vary in width from that of typical *H. densiflorum* ('var. *ambiguum*') to as narrow as those of *H. nitidum*; but the lamina (except for the midrib) is always thin and visible beneath, at least in the living plant. The long narrow inflorescence distinguishes it from *H. densiflorum* but not from *H. nitidum*, which is a larger plant, having leaves usually with no lamina visible beneath.

As Adams (1962) has pointed out, the names *H. galioides* Lam. and *H. axillare* Lam. were published in the same work. The early nineteenth century botanists were unsure of the application of *H. axillare*, so *H. galioides* became the established name.

7. **Hypericum tenuifolium** Pursh, *Fl. Amer. sept.*: 377 (1814). Type: U.S.A., Georgia, no precise locality (fl), *Enslen* s.n. (K-holotype?; PH-isotype).

Figs 15B, 16E, Map 5.



Map 5 Sect. 20: 7. *H. tenuifolium* ● specimens, ○ records (incomplete, as Adams (1959) did not differentiate Spp. 7 and 11); 15. *H. buckleyi* ■ specimens, □ records.

H. coris? sensu Walter, *Fl. Carol.*: 190 (1788), non *H. coris* L. (1753). 'Type': U.S.A., no precise locality, *Herb. Walter* (BM!).

H. fasciculatum [var.] β sensu Choisy, *Prodr. monogr. Hypéric.*:59 (1821) pro parte, quoad syn. *H. tenuifolium*; Torrey & Gray, *Fl. N. Amer.* **1**: 160 (1838) pro parte, excl. syn. *H. axillare*.

H. fasciculatum var. *laxifolium* Choisy in DC., *Prodr.* **1**: 554 (1824) pro parte, excl. syn. *H. michauxii*.

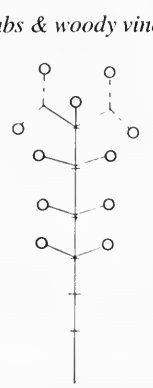
H. fasciculatum var. *aspalathoides* sensu Torrey & Gray, *Fl. N. Amer.* **1**: 672 (1840) pro parte, excl. syn. *Myriandra brachyphylla*, non *H. aspalathoides* Willd. (1802), nom. illegit. (Art. 63).

H. aspalathoides sensu Small, *Man. s.e. fl.*: 872 (1933) pro parte; R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 759 (1960).

H. galioides var. *reductum* Svenson in *Rhodora* **42**: 14 (1940) pro parte excl. typum. Type as for *H. aspalathoides* Willd.

H. reductum W.P. Adams in *Contr. Gray Herb. Harv.*, no. 189: 31 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 712 (1968); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); R. Long & Lakela, *Fl. Trop. Florida*: 608 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.*, Dicots: 343, f. 155 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 358, f. 171 (1988). Type: U.S.A., N. Carolina, Wilmington, n.d. (fl), *Curtis* s.n. (GH!-holotype, NY-isotype).

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 358, f. 171 (1988).



Shrub 0.1–0.5 m tall, decumbent, with branches interweaving at the base but not rooting, forming low mats, or sometimes more erect in dense vegetation. *Stems* reddish, 6-lined when young, eventually 4-lined, then terete; cortex exfoliating in strips or flakes; bark smooth, thin. *Leaves* sessile, 4–11 × 0.4–0.8(–1?) mm, with those in axillary clusters equal or shorter, linear-subulate, dull green above, with margin revolute, completely concealing all but midrib beneath, chartaceous, deciduous at articulation below prominent midrib base (cf. 11. *brachyphyllum*), apex rounded with prominent hydathode, base parallel or slightly expanded; midrib unbranched; glands dense, in 2 rows, visible beneath only. *Inflorescence* 1–7-flowered, without accessory flowers, with 1(3)-flowered dichasia from up to 4 nodes below, rarely with one pair of flowering branches, the whole ± narrowly cylindric; pedicels absent or very short; bracts foliar. *Flowers* 10–14 mm in diam.; buds narrowly cylindric-ellipsoid. *Sepals* 5, (2–)2.5–4 × 0.4–0.5 mm, unequal, linear-subulate, acute to rounded, 1-veined. *Petals* 5, bright? yellow, spreading, 5–10 × 2–5 mm long, oblanceolate-oblong to obovate, with apiculus lateral, acute. *Stamens c.* 50–90, longest 4.5–8 mm, *c.* 0.85–0.9 × petals. *Ovary* 3-merous, 2–3 × 0.5–0.8 mm, very narrowly cylindric, acute; placentation parietal?; styles 3, 2–3 mm long, 0.9–1.2 × ovary, usually separating in fruit. *Capsule* (4–)5.7–9.5 × 1.5–2 mm, narrowly (sub)cylindric, exceeding sepals, thinly coriaceous. *Seeds* blackish, *c.* 0.5 mm long; testa coarsely reticulate (alveoli square to hexagonal). 2n = 18 (n = 9) (Adams in Robson & Adams, 1968).

Dry sandy woods, dunes and dune hollows; lowland and coastal.

South-eastern U.S.A. from North Carolina to central Florida and southern Alabama; four distinct populations: 1) south-eastern N. Carolina and adjacent S. Carolina; 2) extreme south-eastern S. Carolina and adjacent eastern Georgia; 3) central peninsular Florida; 4) coastal Florida 'panhandle' and adjacent Alabama.

U.S.A. Alabama: Baldwin Co., by Ala 180 towards Fort Morgan, *c.* 24 km W. of junction with Ala 59, 8 June 1971 (fl), *Kral* 43098 (BM, MO); Pike Co., Spring Hill, 5 August 1897 (fr), *Bush* 348 (MO). Florida: Bay Co., Gulf Lagoon Beach, SW of Panama City, 20 May 1961 (e. fl), *Adams* 776 (K); Franklin Co., Dog Island, 17 June 1970 (fl), *Godfrey* 69546 (H); Lake Co., Ocala National Forest, 1.75 km N. of Wildcat Lake, *c.* 3.2 km E. of Marion/Lake county line, 2 August 1962 (fl), *Ward & Will* 3048 (BM); Lee Co., near Coconut, 14 April 1930 (fl), *Moldenke* 965 (K); St. Lucie Co., 10.1 km S. of White City, 12 April 1950 (fl), *Hansen* 924 (BM). Georgia: Bryan Co., E. side of Canochee R. *c.* 13 km E. of Pembroke, 8 October 1960 (fr), *Adams* 717 (K, MO); *McIntosh Co., 3.2 km W. of Eulonia, 9 October 1960 (fr), *Adams* 723 (MO). North Carolina: Brunswick Co., SE of Wilmington, 25 June 1890 (fl), *Coville* 86 (K); New Hanover Co., Carolina Beach, 18 June 1939 (fl), *Godfrey* 1260 (BM, K). South Carolina: * ? Co., Bluffton, 1874 (fl), *Mellenchamp* s.n. (MO).

H. tenuifolium, like *H. lloydii*, is closely related to (probably derived from) *H. galioides*, with which it shares all but the peninsular Florida part of its area. It is quite distinct from *H. galioides*, however, in habit, leaf size, inflorescence and habitat. Its distribution does not overlap the piedmont area of *H. lloydii*, which is also decumbent in form but has rooting stems and shorter leaves and (usually) sepals. For a comparison between *H. tenuifolium* and *H. brachyphyllum*, see p. 110.

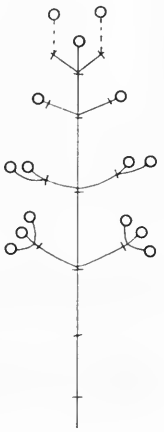
Adams (1962) was aware that *H. tenuifolium* Pursh might be the earliest name for this species. Having been unable to find an authentic specimen, however, he published a new name, *H. reductum*. This was no doubt intended to maintain Svenson's (1940) epithet, although, because Svenson cited *H. aspalathoides* Willd. in synonymy, Adams could not treat his name as a stat. et comb. nov. In Kew (K), however, there is an Enslen specimen from Herb. Pursh. which I consider to be an authentic specimen of *H. tenuifolium*, and so the Philadelphia (PH) specimen cited by Adams can also be considered as authentic. Both these specimens belong to Adams's *H. reductum*, a name which must unfortunately therefore pass into synonymy under *H. tenuifolium* Pursh.

8. **Hypericum lloydii** (Svenson) W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 32 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 712 (1968); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971). Type: U.S.A., S. Carolina, Aiken Co., Graniteville, 4 August 1898 (fl), *Eggert* s.n. (NY-holotype; F!, MO, US-isotypes).

Fig. 15C, Map 4.

H. galioides var. *lloydii* Svenson [in *Rhodora* **42**: t. 587 f. 8 (1940) nomen] in *Rhodora* **54**: 207 (1952).

Icon: Svenson in *Rhodora* **42**: t. 587 f. 8 (1940).

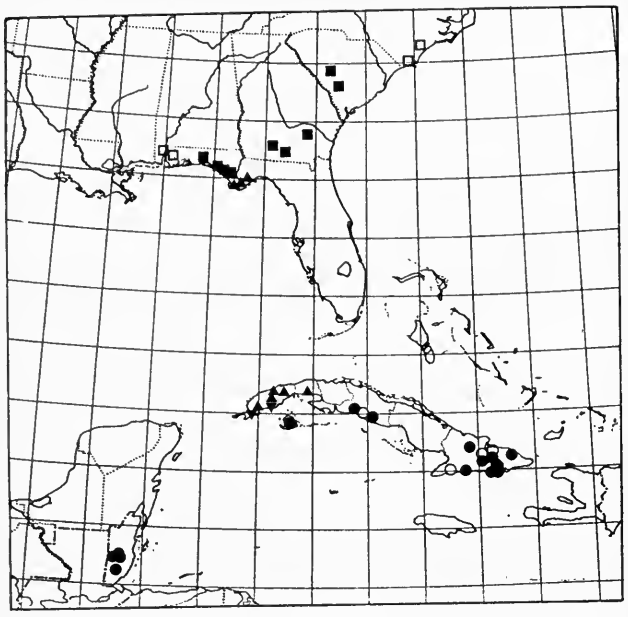


Shrub 0.1–0.5 m tall or rarely taller, with branches straggling and rooting, forming low rounded clumps or mats. *Stems* reddish, 6-lined and ancipitous when young, sometimes eventually 4-lined, then terete; cortex exfoliating in strips or flakes; bark smooth, thin. *Leaves* sessile, with those in axillary clusters smaller; lamina 13–25 × 0.5–0.8 mm, linear-subulate, with margin revolute, paler but not glaucous beneath, with lamina sometimes visible on both sides of midrib, chartaceous, deciduous at basal articulation, apex rounded to retuse with prominent hydathode, base parallel; midrib unbranched; laminar glands rather dense, visible beneath only. *Inflorescence* 1–3-flowered, without accessory flowers, with 1–3(?–5)-flowered dichasia from up to 5 nodes below, without flowering branches, the whole narrowly pyramidal; pedicels *c.* 0.5 mm long; bracts foliar. *Flowers c.* 12–14 mm in diam.; buds broadly ovoid. *Sepals* 5, (3–)4.5–7 × 0.5–0.8 mm, unequal, linear-subulate, subacute to rounded, 1-veined. *Petals* 5, golden yellow, spreading, 5–7.5 × 3–4 mm, oblanceolate-oblong with apiculus obtuse. *Stamens c.* 100, longest (5–)6–7 mm, almost equalling petals. *Ovary* 3-merous, *c.* 3 × 1 mm, narrowly triangular-ovoid; styles 3, 2.5–3 mm long, 0.8–1 × ovary, separating in fruit or earlier; placentation parietal? *Capsule* 3–4 × 2–2.5 mm, 'ovoid', shorter than sepals, thinly coriaceous. *Seeds* black, carinate?, 0.7 mm long; testa not seen.

Dry woods, pine forest, granite outcrops, roadside embankments; inner coastal plain and piedmont; *c.* 150–300 m.

South-eastern U.S.A. from North Carolina to Alabama, excluding Florida.

U.S.A. Alabama: *Tallapoosa Co., *Harper* 3691 (GH, PH, US). Georgia: *Richmond Co., August, 17 July 1899, *Cuthbert* s.n. (FLAS, NY). North Carolina: Chatham Co., U.S. 15–501, *c.* 13 km S. of Pittsboro, 30 June 1966 (fl), *Bell* 18577 (H); *Granville Co., Oxford, *Gillespie* 394 (DUKE, FSU, NCSC); *Wake Co., Cary, July 1898 (fl), *Ashe* s.n. (MO). South Carolina:



Map 6 Sect. 20: 9. *H. nitidum*: a. subsp. *cubense* ● specimens, ○ records; b. subsp. *nitidum* ■ specimens, □ records; c. subsp. *exile* ▲; 10. *H. limosum* ▼.

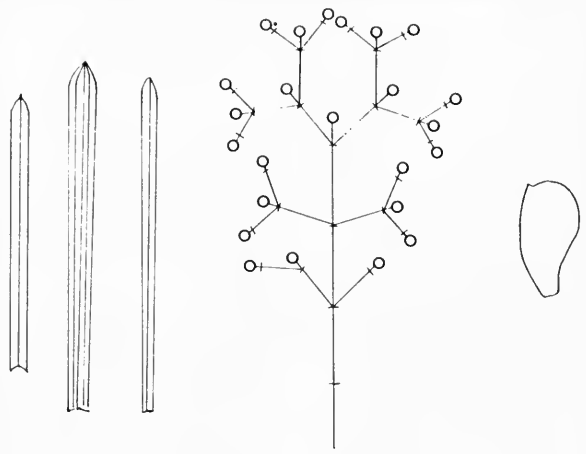
Lancaster Co., 3.2 km S. of Taxahaw, 40 Acre Rock, 19 April 1964 (st), *Creem* 383 (BM).

H. lloydii is closely related to 6. *H. galioides* but differs from it in habit, leaf-shape and habitat (both in altitude and in favouring drier sites); and these species occupy almost distinct areas. It therefore merits recognition as a species.

9. **Hypericum nitidum** Lam., *Encycl.* **4**: 160 (1797); Choisy, *Prodr. monogr. Hypéric.*: 59 (1821), in DC., *Prodr.* **1**: 554 (1824); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 26 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 69 (1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 71 (1968); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 345 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 363, f. 174 (1988). Type: U.S.A., Carolina, ? (P-holotype, microfiche!, GH-fragm. & photograph).
Map 6.

Myriandra nitida (Lam.) Spach, *Hist. nat. vég.* Phan. **5**: 435 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836); K. Koch, *Hort. dendrol.*: 66 (1853).
Hypericum fasciculatum sensu Torrey & Gray, *Fl. N. Amer.* **1**: 672 (1840); Trevir., *Hyper. sp. animadv.*: 15 (1861); Coulter in *Bot. Gaz.* **11**: 85 (1886); R. Keller in Engler & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); et auct. plur. pro parte omnes, quoad syn. *H. nitidum* Lam.
H. galioides var. *fasciculatum* (Lam.) Svenson in *Rhodora* **42**: 12, t. 587, ff. 1–2 (1940) pro parte excl. typum.

Shrub or small tree (0.3–)0.6–4.5 m tall, erect, with branches erect to ascending, forming thickets. *Stems* reddish, 4-lined and ancipitous when young, becoming narrowly 2-winged, eventually terete; cortex exfoliating in flakes or narrow strips; bark brown or reddish to grey, smooth, thin. *Leaves* sessile, (6–)10–21(–26) × 0.5–1.4 mm, with those in axillary clusters as long or usually somewhat shorter, linear



or linear-subulate, sometimes slightly broadened distally, with margin revolute and often completely concealing all but the (sometimes slightly raised) midrib beneath, the non-midrib area sometimes papillose, chartaceous to subcoriaceous, deciduous at basal articulation, apex rounded with prominent hydathode to obtuse-apiculate or long acuminate, base parallel or narrowly cuneate; midrib unbranched, laminar glands dense in 2 rows beneath and scattered above. *Inflorescence* (1)3–15(–32)-flowered, without accessory flowers, often with 1–3(–7)-flowered dichasia from up to 6 nodes below, and sometimes with 1–2 pairs of flowering branches, the whole narrowly to broadly cylindric or very rarely obpyramidal; pedicels 0.5–1 mm long; bracts foliar. *Flowers* 10–18 mm in diam.; buds ovoid, acutely acuminate. *Sepals* 5, (3.5–)4–6.5(–7) × 0.4–0.8 mm in diam.; unequal to subequal, linear-subulate, acute, with margin revolute, 1-veined, midrib unbranched. *Petals* 5, pure yellow, spreading, (5–)6–10 × 3–6 mm, *c.* 1.5 × sepals, obovate to elliptic-oblanceolate, with apiculus lateral, acute. *Stamens c.* 50–80(–115), longest 4.5–6.5(–7) mm, *c.* 0.65–0.8 × petals. *Ovary* (2)3(4)-merous, 3–4.5 × 0.5–1.2 mm, very narrowly pyramidal-ovoid (almost cylindric), acute, placentation parietal; styles 3, 2–3.5 mm long, *c.* 0.7 × ovary, not separating in fruit. *Capsule* (4.5–)5–7 × (1.4–)2–3 mm, very narrowly conic to cylindric. *Seeds* reddish brown, *c.* 0.5 mm long, scarcely carinate; testa finely reticulate. 2n = 18 (n = 9, Adams in Robson & Adams, 1968, for *H. exile*).

In moist habitats (open stream banks, pond margins and ditches), also (in Cuba) in dry meadows and on white sand; lowland (U.S.A.) to 2000 m (Cuba).

South-eastern U.S.A., mainly in Georgia and Florida but with outlying stations in Alabama, South Carolina and North Carolina; also in Cuba (including Isla de Pinos) and Belize.

When considered over its whole range, *H. nitidum* can be divided into three subspecies: a) Cuba and Belize (subsp. *cubense*), giving rise to 11. *H. limosum* in Cuba; b) mainland U.S.A. (subsp. *nitidum*); and c) western Cuba and north-western Florida (subsp. *exile*), giving rise to 12. *H. brachyphyllum*. The whole complex seems to have been derived from a narrow-leaved form of 2. *H. prolificum* (e.g. some Arkansas populations), to which subsp. *cubense* approaches most closely, and to form a sister-group of the *H. fasciculatum* complex (Spp. 12–14) (see Fig. 1, p. 77).

9a. **Hypericum nitidum** subsp. **cubense** (Turcz.) N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 67 (1993).
Fig. 16A.

H. cubense Turcz. in *Bull. Soc. Nat. Moscou* **31**: 384 (1858). Type:

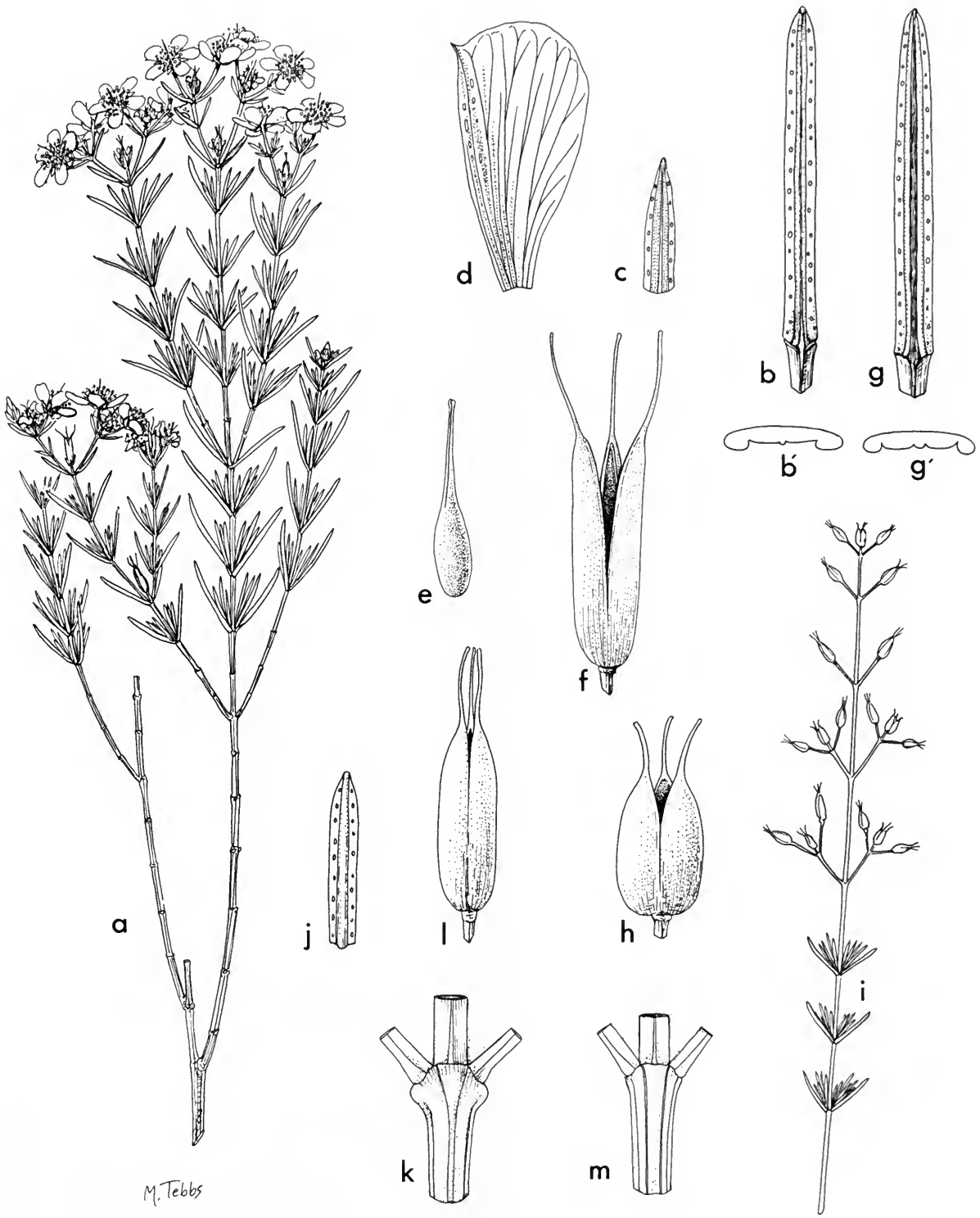


Fig. 16 A. *H. nitidum* subsp. *cubense*: (a) habit; (b) leaf, lower surface and T.S.; (c) sepal; (d) petal; (e) ovary; (f) capsule. B. *H. fasciculatum*: (g) leaf, lower surface and T.S.; (h) fruit. C. *H. lissophloeus*: (i) habit. D. *H. brachyphyllum*: (j) leaf; (k) stem node and leaf bases; (l) capsule. E. *H. tenuifolium*: (m) stem node and leaf bases (a, i × ½; b-m × 4, except b', g' × 8). A. *Whitefoord* 1934. B. *Judd* 2649. C. *Godfrey* 73983. D. *Godfrey* 57862. E. *Herb. Biltmore* 2563a.

Cuba, Oriente Prov., St.-Jago, in cacumine Sierra Moestii, 1500 m, *Linden* 1692 (KW-holotype; BM!, G!, K!, P!, W!-isotypes).

H. aspalathoides sensu Jennings in *Ann. Carneg. Mus.* **11**: 189 (1919).

H. fasciculatum sensu Alain in Leon & Alain, *Fl. Cuba* **3**: 317 (1953) pro parte, quoad syn. *H. cubense* et prov. cit. Oriente et Isla de Pinos; Standley & Williams in *Fieldiana* (Bot.) **7**: 49 (1961); Lippold in *Wiss. Z. Friedr.-Schiller Univ. Jena* (Math.-Nat. R.) **19**: 380, f. 3 (1970) pro parte, quoad syn. *H. cubense* et prov. cit. Oriente et Las Villas et Isla de Pinos.

Shrub or small tree to 4.5 m tall. *Leaves* (6–)10–25 × 0.5–1.6 mm, coriaceous, apex rounded-apiculate to rounded, margin tightly inrolled, usually only midrib visible beneath when dry. *Inflorescence* with terminal dichasium *c.* 7–20-flowered, sometimes with paired flowers or few-flowered dichasia from up to 2 nodes below. *Sepals* obtuse to rounded-apiculate. *Petals* (6.5–)8–10 × 5–6.5 mm. *Capsule* cylindric to rarely ovoid-conic.

Cuba (Oriente, Las Villas, Isla de Pinos), Belize (El Cayo).

CUBA. Oriente: Sierra de Nipe, Río Piloto, 20 April 1919 (fl), *Ekman* 9510 (F, K, S, US); Sierra Maestra, Río Alcarraza, July 1946 (fl), *Clemente* 5069 (GH, US); Moa, between Cerro Miraflores and Moa, *c.* 30 km E. of Sagrade Tánamo, 20 July 1951 (fl), *Webster* 3892 (GH, MICH, US). Las Villas: Trinidad Mountains, Buenos Aires, 22 June 1941, *Howard* 5201 (BM, C, F, G, MO, NY, P, S, SING, U, W, WIS). Isla de Pinos: vicinity of Los Indios, 13 February 1916 (fl), *N. & E. Britton & Wilson* 14181 (F, NY, US); near San Pedro, 8 February 1956 (fl), *Morton* 10040 (BM, US).

BELIZE. Cayo: Mountain Pine Ridge, Augustine, 450 m, 1 January 1959 (fl & fr), *Hunt* 68 (BM, F, MO, NY*, US); Mountain Pine Ridge, Baldy Beacon and vicinity, 900–1020 m, 22 March 1987 (fl), *Davidse & Brunt* 33063 (BM, MO*).

9b. **Hypericum nitidum** subsp. **nitidum**
Map 6.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 363, f. 174 (1988).

Shrub to 3 m or more tall, bushy, many-branched. *Leaves* 10–18 × 0.5–1.5 mm, subcoriaceous, apex obtuse to rounded-apiculate, margin relatively loosely inrolled, part of lower surface besides midrib usually visible. *Inflorescence* mostly cylindric, with terminal dichasium 3–15-flowered and lateral dichasia from 2–6 nodes below. *Sepals* acute to shortly apiculate. *Petals* 5–7(–9) × 3–4(–6) mm. *Capsule* cylindric.

Southeastern U.S.A., from northern Florida and adjacent Alabama to southern N. Carolina.

U.S.A. Alabama: Baldwin Co., *fide* Adams (1962: 26). Florida: Bay Co., just E. of Callaway, 5 November 1959 (fr), *Adams* 350 (DUKE*, F*, FLAS*, GA*, K, MO*, NSCC*, NY*, SMU*, US*); Walton Co., Seven Runs Creek on Fla 81, *c.* 8 km S. of Redbay, 27 January 1962 (fr), *Ward & Myint* 2876 (BM). Georgia: Brantley Co., *c.* 30.5 km E. of Waycross, 1.6 km N. of High Bluff Church, 29 August 1960 (fr), *Kuns* 246 (WIS); Echols Co., 104 km W. of Statesville, 10 June 1961 (st), *Adams* 818 (K). North Carolina: Brunswick Co., *fide* Adams (1962: 26). South Carolina: Bamberg Co., US 301, 0.5 km N. of junction with SC 64, 9 August 1967 (fr), *Bozeman, Radford & Radford* 11394 (BM); Lexington Co., Black Creek, 9.6 km W. of Pelion, 8 August 1939 (fr), *Godfrey & Tryon* 1303 (BM, SING).

9c. **Hypericum nitidum** subsp. **exile** (W.P. Adams) N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 67 (1993).
Map 6.

H. galioides var. *cubense* Griseb., *Cat. Pl. Cuba*: 39 (1866); Jennings in *Ann. Carneg. Mus.* **11**: 189 (1917); non *H. cubense* Turcz. (1858). Type: Cuba, Pinar del Rio, 24 July 1860–64, *Wright* 2126 (GOET-holotype; BM!, GH!, NY!-isotypes).

H. galioides var. *axillare* sensu Griseb., *Cat. Pl. Cub.*: 39 (1866) pro parte, quoad spec. cit. *Wright* 2123.

H. galioides sensu Sauvalle, *Fl. cub.*: 8 (1868).

H. fasciculatum sensu Alain in Leon & Alain, *Fl. Cuba* **3**: 317 (1953) pro parte, excl. typum; Lippold in *Wiss. Friedr. Schiller Univ. Jena* (Math.-Nat. R.) **19**: 380, f. 3 (1970) pro parte, quoad syn. Griseb. et spec. cit. ex Prov. Pinar del Río.

H. exile W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 33 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.*, Dicots: 345 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 370 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 362, f. 173 (1988). Type: U.S.A., Florida, Gulf Co., 4 km E. of Port St. Joe, 20 May 1960 (fl), *Adams* 456 (GH!-holotype; DUKE*, FLAS*, FSU*, GA*, K!, MO*, NCSC*, NCU*, NY*, SMU*, US!-isotypes).

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 362, f. 173 (1988).

Shrub to *c.* 1 m tall, slender, little-branched. *Leaves* 9–26 × 0.5–0.8 mm, chartaceous, apex acute to long-acuminate, margin tightly inrolled, midrib visible beneath. *Inflorescence* mostly cylindric, with terminal dichasium 3–7-flowered and lateral dichasia from 3–6 nodes below. *Sepals* acute to long-acuminate. *Petals* 6–7 × 3–4 mm. *Capsule* cylindric to narrowly conic.

Sandy soil in open pinewoods.

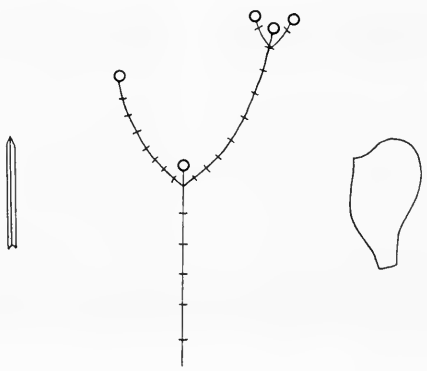
U.S.A. (NW Florida), Cuba (Pinar del Río, Isla del Pinos).

U.S.A. Florida: Franklin Co., 16 km W. of Apalachicola, *Adams* 473 (FSU*); Gulf Co., N. of Apalachicola, 5 May 1930 (fl), *Moldenke* 1146 (K); Liberty Co., Apalachicola National Forest, *c.* 1.6 km E. of Sumatra, 26 April 1975 (fl), *Godfrey* 74289 (BM, FSU*).

CUBA. Pinar del Río: Río Guao, 26–27 February 1911 (fl & fr), *N. & E. Britton & Cowell* 9618 (F, GH, K, MO, NY); Herredura, 13 April 1920 (fl), *Ekman* 10793 (G, K, S); Viñales, April 1930 (fl), *Leon* 14329 (GH, US). Isla de Pinos: *fide* Jennings (1917) under *H. galioides* var. *cubense*.

Although subsp. *exile* is more variable in Cuba than in Florida, the variation in the two areas overlaps. There can be therefore little doubt that the two populations belong to the same taxon.

10. **Hypericum limosum** Griseb., *Cat. Pl. Cub.*: 39 (1866); Lippold in *Wiss. Z. Friedr.-Schiller Univ. Jena* (Math.-Nat. R.) **19:** 381 (1970) pro parte, excl. syn. *H. brachyphyllum* pro parte. Type: Cuba, Pinar del Río, in terra spongiosa ad Lagunas, pr.[ope] S. Julian, 1861–1864 (fl), *Wright* 2125 (GOET-holotype; BM!, G!, GH!, MO!, NY!, P!, S!, US!-isotypes).
Map 6.



Shrublet (or *annual herb*?) 0.15–0.6 m, erect, branching above base, with branches slender, lower erect, upper divergent. *Stems* reddish?,

4-lined and ancipitous when young, soon 2-lined, eventually terete; cortex exfoliating in strips; bark smooth, thin. *Leaves* sessile, 3–6 × 0.5–1.1 mm, with those in axillary clusters usually as long, linear-subulate, with margin revolute, sometimes completely concealing all but the midrib beneath, the non-midrib area rugose-papillose, chartaceous, deciduous at basal articulation, apex acute to rounded-subapiculate, base parallel or narrowly cuneate; midrib unbranched; laminar glands dense, in 2 rows beneath and towards margin above. *Inflorescence* 3–*c.* 15-flowered, (always?) mixed dichasial/pseudo-dichotomous, without lower axillary dichasia, the whole diffusely obconic; pedicels to 0.5 mm long; bracts foliar. *Flowers c.* 10 mm in diam.; buds broadly ellipsoid, subacute. *Sepals* 5, 2.5–3.5 × 0.7–0.8 mm, subequal, linear-oblong to oblanceolate, apiculate-obtuse, with margin revolute, 1-veined, midrib unbranched. *Petals* 5, pure? yellow, ascending to spreading, 6–8 × 3.5–5 mm, *c.* 2.4 × sepals, curved-obovate, with apiculus lateral, minute or absent. *Stamens c.* 30, longest 3.5–4 mm, *c.* 0.5–0.6 × petals. *Ovary* 3-merous, 2–2.5 × 1 mm, very narrowly pyramidal-ovoid, acute, placentation parietal; styles 3, 1.2–1.5 mm long, *c.* 0.6 × ovary, separating in fruit. *Capsule* 4–5 × 2–2.5 mm, cylindric. *Seeds* not seen.

Margins of lakes, marshes and streams on poor sandy soils; lowland.

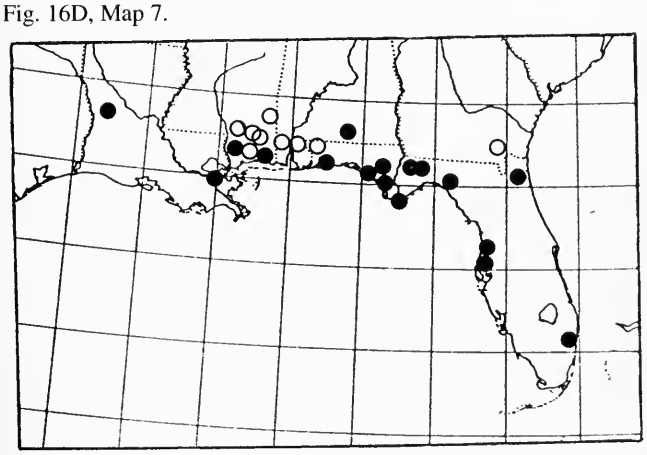
Cuba (extreme western Pinar del Río).

CUBA. Pinar del Río: Between Guane and Remates, Laguna de Cabo, near sea level, 23 December 1937 (fl), *Killip* 3233 (US); Laguna Jovero to Laguna Herradura, 12 December 1911 (fl & fr), *Shafer* 10928 (F, MO, NY, US); Rio Guao, 26–27 February 1911 (fl), *N. & E. Britton & Cowell* 9618 (U, US).

H. limosum is, both morphologically and geographically, clearly derived from the Cuban population of *H. nitidum* subsp. *cubense*, differing from it essentially in habit and by the constantly smaller leaves, flowers and fruit and mixed inflorescence. *H. brachyphyllum* appears to be a parallel derivation from *H. nitidum* subsp. *exile*, and so it is not surprising that it was confused with *H. limosum* by Adams (1962: 30) and Lippold (1970).

11. **Hypericum brachyphyllum** (Spach) Steud., *Nomencl.* 2nd ed. **1**: 787 (1840); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 27 (1962), in *J. Elisha Mitchell scient. Soc.* **87**: 70 (1973); R. Long & Lakela, *Fl. Trop. Florida*: 608 (1971); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Godfrey & Wooten, *Aquatic & wetland pls S.W.*, Dicots: 343 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 370 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 357, f. 170 (1988). Type as for *Myriandra brachyphyllum* Spach.

Fig. 16D, Map 7.



Map 7 Sect. 20: 11 *H. brachyphyllum* ● specimens, ○ records (incomplete, as Adams (1959) did not differentiate Spp. 9 and 13).

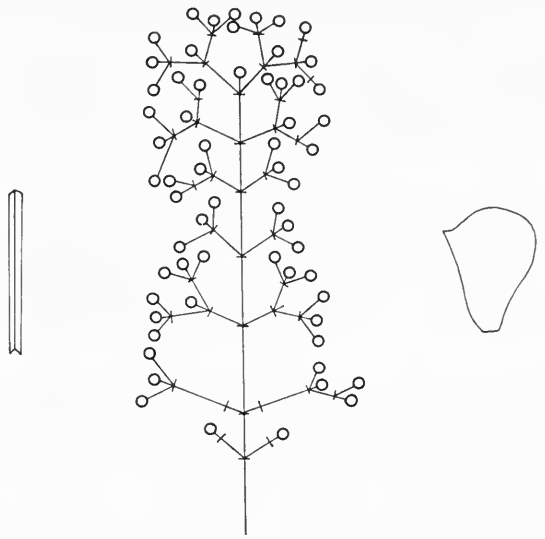
H. aspalathoides sensu Elliott, *Sketch bot. S. Carolina* **2**: 27 (1821); Chapm., *Fl. South. U.S.* 3rd ed.: 57 (1897).

Myriandra brachyphylla Spach, *Hist. nat. vég.* Phan. **5**: 435 (1836), in *Ann. Sci. nat.* (Bot.) II, **5**: 365 (1836); K. Koch, *Hort. dendrol.*: 66 (1853) pro parte, excl. syn. Type: U.S.A., Florida, Apalachicola, 1835 (fr), *Drummond* s.n. (P!-holotype; GH!, K!, W!-isotypes).

H. fasciculatum var. *aspalathoides* sensu Chapm., *Fl. South. U.S.*: 40 (1865).

H. fasciculatum sensu Coulter in *Bot. Gaz.* **11**: 85 (1886) pro parte, quoad syn. *Myriandra brachyphylla.*

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 357, f. 170 (1988).



Shrub (0.3–)0.5–1(–1.5) m tall, usually 1-stemmed, erect, forming rounded bush, with branches erect. *Stems* reddish to brownish, sometimes 4-lined when very young (especially just below node), very soon 2-lined and ancipitous, not becoming terete; cortex exfoliating in strips or plates; bark smooth, thin. *Leaves* sessile, 6–11(–12) × 0.5–0.7 mm, with those in axillary clusters usually half as long to as long, linear, plano-convex, glossy green above, with margin revolute but not concealing all surface beneath, the non-rib area almost smooth, chartaceous, deciduous at basal articulation (midrib base not prominent, cf. 9. *H. tenuifolium*), apex rounded-apiculate, base parallel; midrib unbranched; laminar glands few, dense, in 2 rows beneath. *Inflorescence* 3–*c.* 15-flowered, dichasial or occasionally mixed dichasial/pseudo-dichotomous, without accessory flowers, with 3–5-flowered dichasia or flowering branches from up to *c.* 10 nodes below, the whole ± narrowly cylindric; pedicel absent or up to *c.* 1 mm; bracts foliar. *Flowers* 10–13 mm in diam.; buds narrowly ovoid-conic. *Sepals* 5, 2.5–4.5 × 0.5–1 mm, unequal, linear, acute, 1-veined. *Petals* 5, bright yellow, spreading, 5–8 × 2.5–5 mm, obovate-spathulate, with apiculus lateral, acute. *Stamens c.* 40–45, longest 4–6 mm, *c.* 0.75–0.8 × petals. *Ovary* 3-merous, 2–2.5 × 0.5 mm, very narrowly cylindric, acute, placentation parietal; styles 3, 3 mm long, 1.2–1.5 × ovary, separating or deciduous in fruit. *Capsule* 3.5–5 × 1.5–2 mm, narrowly cylindric to narrowly ovoid-conic, exceeding sepals, thinly coriaceous. *Seeds* dull brown, 0.4–0.6 mm long; testa finely reticulate (alveoli circular-hexagonal). 2n = 18 (n = 9) (Adams in Robson & Adams, 1968).

In moist habitats (pine flatwoods, pond margins, borrow pits, swamp woodland); lowland.

U.S.A. (Georgia and Florida to Louisiana).

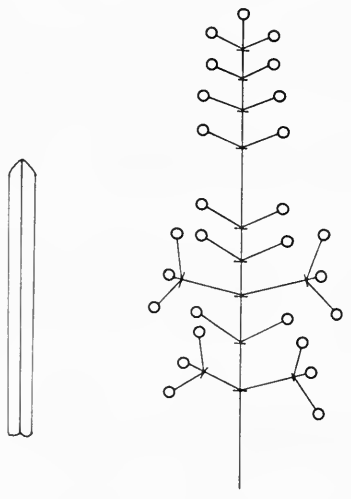
U.S.A. Alabama: Geneva Co., by county 4, *c.* 16 km E. of Florala, 2 August 1971 (fl), *Kral* 43455 (BM); *Covington Co., *c.* 11.8 km S. of Opp, *Shinners* 27453 (FSU). Florida: Bay Co., West Bay, 12 August 1954 (fl), *Ford* 4526 (BM). Collier Co., Deep Lake Strand, *c.* 8 km E. of Miles City, 20 September 1965 (fr), *Ward* 5233 (BM); Liberty Co., 0.16 km N. of junction Fla 20 and Fla 276, 14 November 1959 (fr), *Adams* 372 (K, MO); Wakulla Co., 1.6 km N. of St. Marks, 17 October 1958 (fr), *Godfrey* 57862 (BM, FSU*). Georgia: *Coffee Co., 13 km E. of Douglas, *Adams* 830 (FSU, GA); *Early Co., 14.2 km SE of Blakeley, *Adams* 790 (DUKE, FSU, GA, USF). Louisiana: New Orleans Par., New Orleans, 1832 (fl), *Drummond* 51 (BM); Vernon Par., Anacoco, 60 m, 14 July 1964 (fl), *Demaree* 50849 (BM). Mississippi: *Forrest Co., Rte 13, SW of Young, 2 August 1987 (fl), *Hill* 18458 (MO); Jackson Co., Ocean Springs, 24 August 1951 (fl), *Demaree* 31293 (BM, H).

H. brachyphyllum appears to be a derivative of 10c. *H nitidum* subsp. *exile*. It is very similar to the more reduced form of that subspecies in western Cuba, but less so to the larger (type) form in Cuba and north-western Florida. It can be distinguished from subsp. *exile* by the bushier habit, usually smaller leaves and smaller flowers, shorter styles and smaller capsule. It can, on the other hand, be confused superficially with 9. *H. tenuifolium* (a reduced 'form' of *H. galioides*, not of *H. nitidum*), but it has a bushy habit, 2-sided shoots, glossy leaves without prominent base or subapical hydathode, and finely reticulate seeds, and it grows in wet habitats.

12. **Hypericum lissophloeus** W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 21 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Ward & Godfrey in D. Ward, *Rare & endangered biota of Florida*, 5. Plants: 35 (1980); Godfrey & Wooten, *Aquatic & wetland pls. s.e. U.S.* Dicots: 343 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 371 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 360, f. 172 (1988). Type: U.S.A, Florida, Bay Co., shores of Merial Lake, *c.* 16 km N. of Panama City, 14 June 1960 (fl & fr), *Godfrey & Triplett* 59844 (GH-holotype; DUKE, F!, FLAS, FSU, GA, IA, ILL, K!, MSC, NY, SMU, US!-isotypes).

Fig. 16C, Map 3.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 360, f. 172 (1988).



Shrub to 4 m tall, erect, slender, sparsely branched, forming dense clumps sometimes with prop-roots, with branches suberect to ascending. *Stems* silvery-brown (gun-metal colour), light reddish brown beneath, 4-1ined, ancipitous and glaucous when young, soon 4-angled, eventually terete; cortex exfoliating in large thin curled plates; bark chestnut-brown, smooth, thin, polished, becoming metallic-silvery. *Leaves* sessile, (9–)12–17 × 0.5–0.75 mm, with those in axillary clusters almost as long, linear-subulate to acicular, incurved, with revolute margin not wholly obscuring papillose lower surface, glaucous when young, subcoriaceous, deciduous at basal articulation, apex obtuse to rounded, base not or scarcely expanded; midrib unbranched; laminar glands numerous, especially visible beneath, marginal glands dense. *Inflorescence* 1–3-flowered, usually with paired flowers or triads from up to 9 nodes below, the whole very narrowly cylindric; pedicels 2–3 mm long; bracts foliar. *Flowers c.* 20 mm in diam.; buds ovoid, acute. *Sepals* 5, 7–8 × 0.5–0.75 mm, subequal, linear-subulate, acute, 1-veined, deciduous. *Petals* 5, bright yellow, spreading?, 10–12 × 5–6 mm, obovate-spathulate, with apiculus lateral, acute, rather short. *Stamens* 170–221, longest 8–9 mm, 0.75–0.8 × petals. *Ovary* 3(4)-merous, *c.* 3.5 × 1.2 mm, narrowly ellipsoid, placentation parietal; styles 3(4), *c.* 5 mm long, *c.* 1.4 × ovary, separating in fruit. *Capsule* 6–7 × 2.5–3.5 mm, narrowly ovoid to ellipsoid, shorter than sepals, thinly coriaceous. *Seeds* tan to dark brown, 1–1.6 mm long, shallowly carinate; testa very coarsely reticulate-sulcate. 2n = 18, n = 9 (Lewis, Stripling & Ross, 1962).

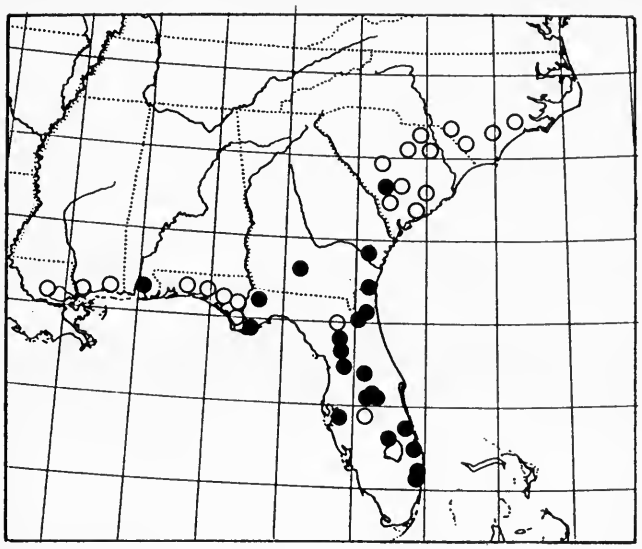
In sandy soil on shores of sinkhole ponds and lakes, often in water to 1.5 m deep; lowland.

U.S.A. (NW Florida, Bay and Washington Counties only).

U.S.A. Florida: Bay Co., Lake Merial, E. of Fla 77, 24 km N. of Panama City, 23 August 1966 (fr), *Ward* 5958 (BM, FSU*); Washington Co., Long Pond, 7 km S. of New Hope, Fla 77, 12 October 1974 (fr), *Godfrey* 73983 (BM, FLAS*).

As Adams (1962) remarked, *H. lissophloeus* is distinguished from the *H. fasciculatum* complex (Spp. 12–14) by many features, including the smooth polished metallic bark (which exfoliates like a species of *Betula*), the slender, wand-like, lax or drooping younger stems, the large seeds with furrowed testa, and the glaucous young shoots; and it sometimes grows in association with 10b. *H. nitidum* subsp. *nitidum* and 13. *H. fasciculatum,* remaining distinct from both. Adams failed to mention the large capsules and wholly 1–3-flowered lateral inflorescence-branches, which help to remove *H. lissophloeus* from both the *H. nitidum* and the *H. fasciculatum* groups, despite the linear-subulate leaves. Indeed, the capsules are nearer in form to those of *H. prolificum* than to those of *H. fasciculatum* and even more different from the narrow capsules of the *H. nitidum* group. It seems most appropriate, therefore, to regard *H. lissophloeus* as an early development of the evolutionary line from *H. prolificum* to *H. fasciculatum*, after the departure of the *H. nitidum* complex.

13. **Hypericum fasciculatum** Lam., *Encycl.* **4**: 160 (1797); Pursh, *Fl. Amer. sept.* **2**: 376 (1814); Elliott, *Sketch bot. S. Carolina* **2**: 28 (1821); Choisy, *Prodr. monogr. Hypéric.*: 59 (1821), in DC., *Prodr.* **1**: 554 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 160 (1838) pro parte, excl. [var.] β *axillare* et syn. *H. tenuifolium* Pursh et *H. coris?* Walter et *H. michauxii* Poiret; Trev., *Hyperic. animadv.*: 15 (1861) pro parte quoad typum; Chapman, *Fl. South. U.S.*: 40 (1865) excl. var. *aspalathoides*; Coulter in *Bot. Gaz.* **11**: 85 (1886) pro parte excl. syn. *H. nitidum* Lam. et *Myriandra* spp., in A. Gray, *Syn. Fl. N. Amer.* **1**: 286 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925) pro parte, excl. syn. *H. nitidum* Lam.; Small, *Man. s.e. fl.*: 872 (1933); Lott in *J. Arnold Arbor.* **19**: 150 (1938) pro parte, quoad typum et syn. *Myriandra brathydis* Spach; R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 757 (1960); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 24 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70



Map 8 Sect. 20: 13. *H. fasciculatum* ● specimens, ○ records (incomplete, as Adams (1959) did not differentiate Spp. 9 and 13).

(1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 712 (1968); Long & Lakela, *Fl. trop. Florida:* 607 (1971); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots.: 245 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 371 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida. etc.*: 364, f. 175 (1988); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 69 (1995). Type: U.S.A. S. Carolina, 'Carolina' (fl), *Fraser* s.n. (P-LA-holotype, BM!-microfiche, GH-photograph; BM!, G-DC!, K!-isotypes). The Lamarck specimen is labelled merely 'Carolina', whereas the BM specimen has 'Carolina australis' and the Geneva and Kew specimens 'Carolina med.'; but they may all be duplicates of one Fraser collection.

Fig. 16B, Map 8.

H. aspalathoides Willd., *Sp. pl.* **3**: 1451 (1802); Pursh, *Fl. Amer. sept.* **2**: 376 (1814), nom. illegit. (Art. 63). Type as for *H. fasciculatum* Lam.

?*H. fulgidum* Raf., *Fl. ludov.*: 88 (1817). Type: U.S.A., Louisiana?, *Robin* (?). Adams (1962) suggested that this epithet might apply to *H. fasciculatum*, despite the absence of that species today from Louisiana. I have not seen the type, but the description could also apply to either of the small ('2ft') linear-leaved members of sect. *Myriandra* that do occur in that state, viz. *H. galioides* and *H. brachyphyllum.*

Myriandra brathydis Spach, *Hist. nat. vég.*, Phan. **5**: 436 (1836), nom. illegit. (Art. 63). Type as for *Hypericum fasciculatum* Lam.

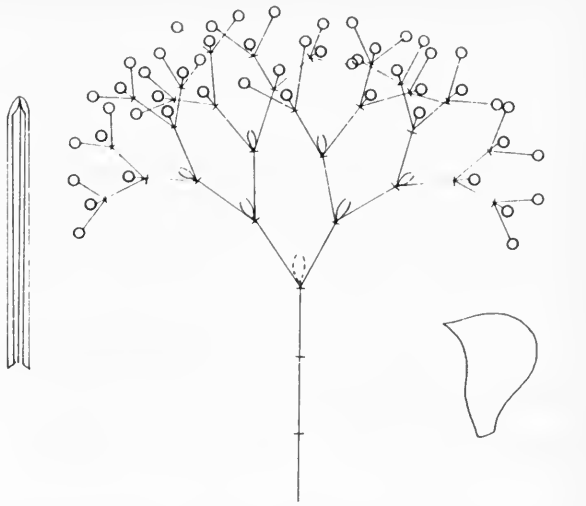
Hypericum fasciculatum var. *aspalathoides* (Willd.) Torrey & Gray, *Fl. N. Amer.* **1**: 672 (1840) pro parte, quoad basionym; S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 126 (1878).

?*Brathydium fulgidum* (Raf.) K. Koch, *Hort. dendrol.*: 67 (1853).

Hypericum galioides var. *fasciculatum* (Lam.) Svenson in *Rhodora* **42**: 12, t. 587 f. 1 (1940).

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 364, f. 175 (1988).

Shrub to 1.5(–3) m tall, erect, much branched above but not tree-like, with branches erect or narrowly ascending. *Stems* orange-brown, 6-lined and strongly ancipitous when young, soon narrowly 2-winged, eventually terete; cortex exfoliating in thin papery sheets or plates



exposing red bark beneath; bark either corky or spongy with inconspicuous laticifers, thick. *Leaves* dark green (cf. *H. chapmanii*), sessile, (8–)10–17(–20) × 0.7–1 mm, with those in axils as long, linear-subulate, sometimes slightly broadened distally, with margin revolute, overarching all but the ± raised midrib area beneath and forming 2 longitudinal grooves lined with papillae, chartaceous to subcoriaceous, deciduous at basal articulation, apex rounded-apiculate to acute, base parallel; midrib unbranched; laminar glands dense, in 2 often uneven rows beneath and scattered above. *Inflorescence* (3–)7–32-flowered, without accessory flowers, sometimes with single flowers or 3–5-flowered dichasia from up to 3 nodes below, the main inflorescence sometimes reverting to vegetative growth before producing more flowers, the whole rounded-pyramidal to corymbiform; pedicels absent or almost so; bracts foliar. *Flowers* 13–16 mm in diam.; buds ovoid, acute. *Sepals* 5, (3)4.5–8(–10) × 0.5 mm, unequal, linear-subulate, acute, with margin revolute, 1-veined, midrib unbranched, eventually deciduous. *Petals* 5, bright yellow, 6–9 × 4–5 mm, *c.* 1.2 × sepals, obovate-spathulate, with apiculus lateral, acute. *Stamens c.* 70–100, longest 5–6.5 mm, 0.7–0.85 × petals. *Ovary* 3-merous, 2.5–3 × 1–1.5 mm, very narrowly pyramidal-ovoid, acute, placentation parietal; styles 3, 2.5–3 mm long, equalling ovary, separating in fruit. *Capsule* 5.5 × 2.5–3 mm, ovoid-conic to ovoid-ellipsoid, 3-sulcate. *Seeds* dull brown, *c.* 0.4 mm long, ecarinate; testa finely foveolate-reticulate. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Margins of cypress ponds and lakes, marshes and ditches; lowland.

U.S.A. (southeastern North Carolina to southern Mississippi, including all Florida).

U.S.A. Alabama: Baldwin Co., just N. of junction 1–10 by Ala 59, 9.6 km S. of Stapleton, Hwy 21, 8 June 1971 (fl), *Kral* 43080 (BM). Florida: Brevard Co., Okeechobee region, 3 August 1903 (fl & fr). *Fredholm* 5930 (K, MO); Dade Co., Humbugus Prairie, 8 July 1915 (fl & fr), *Small, Mosier & Small* 6878 (K, MO); Duval Co.?, near Jacksonville, May 18— (fl), *Curtiss* 258 (BM, K, FR); Liberty Co., 5.6 km N. of Bristol, 14 November 1959 (fr), *Adams* 364 (K, MO); Lake Co., Kirkland Lake, 20 March 1967 (fl), *Harriman* 1051 (H); Martin Co., N. of St. Lucie R., E. side of US 1, 5 May 1962 (fl & fr), *Lakela* 25048 (BM); Orange Co., 6.4 km S. of Oakland, 8 August 1958 (fr), *Godfrey* 57329 (BM, FSU*); Palm Beach Co., 24 km W. of West Palm Beach, 18 June 1937 (fl & fr), *Brooks & Murray* 5 (BM). Georgia: Colquitt Co., 9.6 km SE of Moultrie, 8 June 1958 (fl), *Adams* 13 (K, MO); Sumter Co., 15 July 1901 (fl), *Harper* 1076 (BM, MO). *Echols Co., *c.* 13 km W. of Fargo, *Adams* 820 (FSU, GA, GH). Mississippi: southern Mississippi, *fide* Adams (1962: 24). N. Carolina: no precise locality, n.d. (fr), *Nuttall* s.n. (BM). S. Carolina: *Lexington Co., 9.6 km S. of Columbia, 7 August 1939 (fr), *Godfrey & Tryon* 1201 (MO). Texas: ?

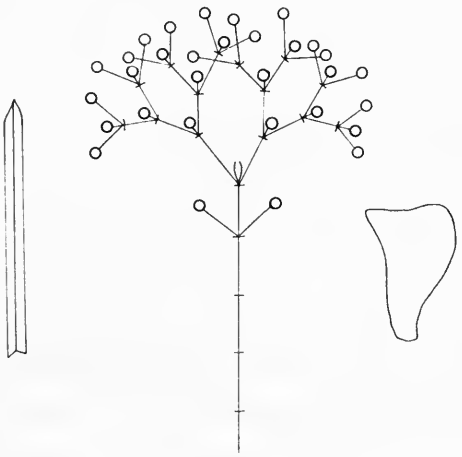
The epithet *fasciculatum* refers to the crowded leaves of the axillary shoots, which in this species are usually as long or almost as long as the subtending ones, in contrast to those of species of the *H. nitidum* group, where they are usually shorter than the subtending leaves. In addition, *H. fasciculatum* differs from *H. nitidum* in its thicker, sometimes spongy bark; its leaves with the lower surface raised, forming two lateral grooves; its inflorescence, which is more corymbiform than cylindric; and its ovoid-ellipsoid rather than cylindric capsules. Both species occur (in the United States) from southern N. Carolina to southern Alabama, but the distribution of *H. fasciculatum* extends throughout peninsular Florida and into Mississippi, whereas *H. nitidum* subsp. *nitidum* does not occur south of the Florida panhandle or west of Alabama.

14. **Hypericum chapmanii** W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 22 (1962); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 346 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 371 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 366, f. 176 (1988). Type as for *H. arborescens* Chapm. non Vahl.

Map 3.

H. arborescens Chapm., *Fl. South. U.S.* 2nd ed., suppl. 2: 680 (1892), non Vahl (1791). Type: Adams (1962) failed to locate a Chapman specimen of this species dating from 1892 or earlier, and I have not seen one either. *Herb. Biltmore* no. 5735a (see below) serves as a representative specimen until a type is discovered.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 366, f. 176 (1988).



Shrub, usually one-stemmed and tree-like, up to 4 m tall, erect, with branches narrowly ascending. *Stems* orange-brown, 4-lined and ancipitous when young, soon 4-angled, eventually terete; cortex exfoliating in thin papery sheets or plates, exposing reddish brown to cinnamon bark beneath; bark spongy, thick, appearing fluted when torn apart owing to the presence of large vertically aligned laticifers, furrowing and disintegrating to expose stringy covering of the laticifers. *Leaves* light green (cf. *H. fasciculatum*), sessile, (8–)11–16(–25) × 5–7 mm, with those in axils as long, linear-subulate, with margin revolute, overarching all but the raised midrib area beneath and forming 2 longitudinal grooves lined with papillae, chartaceous, deciduous at basal articulation, apex narrowly acute, base parallel or slightly expanded; midrib unbranched; laminar glands ± dense, in 2 regular rows beneath and scattered above. *Inflorescence* 1–3-flowered, without accessory flowers, often with 1–3 flowers in axil of leaves at 1–2 nodes below, the whole then shortly cylindric; pedicels absent; bracts foliar. *Flowers* 12–15 mm in diam.; buds ovoid, acute. *Sepals* 5, 5–7 × 0.5 mm, unequal, linear-subulate, acute, with margin revolute, 1-veined, midrib unbranched. *Petals* 5, bright? yellow, 7–9 × 3–4.5 mm, *c.* 1.3–1.4 × sepals, oblong-spathulate, with apiculus lateral, acute. *Stamens c.* 75, longest 5–5.5 mm (or longer?), *c.* 0.7 × petals. *Ovary* 3-merous, *c.* 3 × 1 mm, very narrowly pyramidal-ovoid, acute, placentation parietal; styles 3, 2.5–4 mm long, *c.* 0.7–1 × ovary, slightly separating at apex in fruit. *Capsule c.* 6 × 2.4 mm, narrowly pyramidal-ovoid, 3-sulcate. *Seeds* dull brown, 0.6–0.8 mm long, ecarinate?; testa finely foveolate-reticulate.

Flatwoods, depressions, margins of cypress ponds, and borrow pits; lowland.

U.S.A. (NW Florida).

U.S.A. Florida: *Bay Co., NE of Vicksburgh, *Adams* 513 (FSU); Franklin Co.?, Apalachicola, near the coast, July-September 1893 (fl), *Chapman* in *Herb Biltmore* 5735a (A*, BM, GH, NY*); Gulf Co., 4 km SE of Port St Joe, 18 June 1958, *Adams* 45 (K); *Santa Rosa Co., *Tyson* 485 (FLAS); *Liberty Co., *c.* 5 km SW of Kern, *c.* 8 km SW of Wilma, Apalachicola Nat. For., 9–12 m, 13 September 1989 (fr), *Orzell & Bridges* 12061 (MO).

H. chapmanii is apparently a local derivative of *H. fasciculatum*, differing from that species in its taller single-stemmed habit, thicker stems (100–150 mm as opposed to up to 50 mm) that are less markedly ancipitous when young, spongy bark with large laticifers that give a striated or fluted aspect and darken with age, lighter green leaves that are markedly ascending, and a fewer-flowered inflorescence. It would be interesting to know how these differences arose and are apparently maintained between two species with similar habitats and with the distributional area of one completely within that of the other.

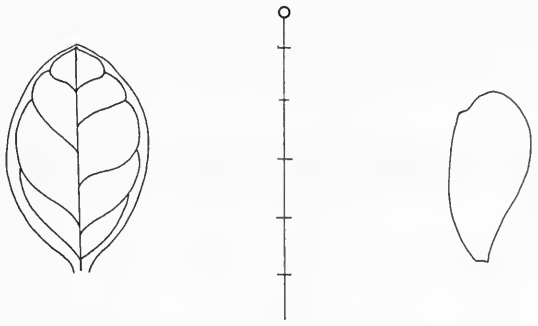
Subsect. 2. **Pseudobrathydium** R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 214 (1893) sub sect. *Brathydium*; W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 33 (1962) emend. Type: *H. buckleyi* M.A. Curtis (holotype).

Dwarf wiry shrubs with leaves not articulated at base, persistent or deciduous above base; inflorescence-branching dichasial or absent, acropetal; sepals 5, subequal, persistent; stamens *c.* 100, persistent; petals 5; styles and placentae 3, placentation incompletely axile. Species no. 15.

15. **Hypericum buckleyi** M.A. Curtis in *Amer. J. Sci.* **44**: 80 (1843) ['*buckleii*']; Chapm., *Fl. South. U.S.*: 39 (1865); S. Watson, *Bibliogr. index N. Amer. bot.*: 125 (1878); Coulter in *Bot. Gaz.* **11**: 83 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 285 (1897); Sargent in *Gdn Forest* **4**: 581, f. 10 (1891); C.K. Schneider, *Ill. Handb. Laubholzk.* **2**: 33, f. 222a (1912); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Small, *Man. s.e. fl.*: 873 (1933): Svenson in *Rhodora* **42**: 19 (1940); Rehd., *Man. cult. trees* 2nd ed.: 641 (1940); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 37 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Radford, Ahles & Bell, *Man. vasc. pls Carolinas*: 713 (1968); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 414 (1973); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots.: 348 (1981); Barker & Cheek in *Kew Mag.* **11**: 65–69, t. 245 (1994); Wilbur in *Castanea* **60**: 166–167 (1995) ['*buckleii*']; N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 69 (1995) [sphalm. '*buckleiyi*']. Type: U.S.A., N. Carolina, Macon Co., 'in montibus Carolinae et Georgiae, Pickens Nose', June [1842] (fl), *Buckley* s.n. (GH-lectotype, P. Adams, 1962; BM!, NY-syntypes).

Map 5.

Icones: Sargent in *Gdn Forest* **4**: 581, f. 10 (1891); Justice & Bell, *Wild fls N. Carolina*: 118 (1968); Barker & Cheek in *Kew Mag.* **11**: t. 245 (1994).



Shrub 0.05–0.45 m tall, decumbent, spreading, with branches erect to ascending from decumbent rooting base, forming low compact mats. *Stems* reddish, 4-lined and ancipitous; cortex exfoliating in strips; bark reddish brown, smooth, thin. *Leaves* sessile or with pseudopetiole to 1 mm long; lamina 4–25 × 2–12 mm, oblong or elliptic to oblanceolate or obovate, plane, paler beneath, chartaceous, persistent or breaking off at top of pseudopetiole, apex rounded, base cuneate; venation obscure: (2)3(4) pairs of main laterals without visible subsidiaries or tertiaries, only midrib prominent; laminar glands dense. *Inflorescence* 1(3–5)-flowered, terminal; pedicels 1.5–3 mm long; bracts foliar. *Flowers* 20–25 mm in diam.; buds broadly ovoid. *Sepals* 5, 4–5 × 2.5–3 mm (to 6 × 3.5 mm in fruit), not imbricate, subequal, persistent, broadly elliptic to elliptic-spathulate or obovate, obtuse, plane, basal veins 3, not or obscurely branched. *Petals* 5, golden yellow, becoming reflexed, 6–10.5 × 3–5 mm, 1.5–2 × sepals, oblanceolate, with apiculus lateral, obtuse. *Stamens c.* 100, longest 6–9 mm, *c.* 0.8 × petals. *Ovary* 3-merous, 3–4 × 2–3 mm, narrowly ovoid, acute, placentation incompletely axile; styles 3, 2.5–4 mm long, 0.85–1 × ovary, separating in fruit. *Capsule* 8–12 × *c.* 5 mm, narrowly ovoid to ovoid-cylindric, acute, rounded-trigonous, exceeding sepals, thinly coriaceous. *Seeds* 1.5–2 mm long, dark brown, narrowly to broadly carinate; testa finely scalariform.

Seepage areas, moist crevices and sometimes ditches and road embankments; 900–1560 m.

Eastern U.S.A. (southern Appalachian Mts – N. Carolina and Georgia – and in adjacent S. Carolina).

U.S.A. N. Carolina: Haywood Co., Mt Pisgah, 14 August 1972 (fr), *Herb. Biltmore* 1319b (BM, G, H, JE, K, MO); Macon Co., Highlands, Mt Satulah, 25 June 1960 (fl), *Adams* 528 (K). S. Carolina: Greenville Co., French Broad R. near Caesar's Head, n.d. (fr), *Gray* s.n. (K). Georgia: ? Co. summit of Thomas Bald, 1560 m, August 1893 (fr), *Small* s.n. (G, H, MO).

Although *H. buckleyi* differs markedly in habit and leaf-shape from all other 5-petalled species in sect. *Myriandra*, the large ovoid capsules and relatively broad leaves indicate that its nearest relative is *H. prolificum*, of which some montane specimens from N. Carolina (e.g. *Leonard, Radford & Moore* 1805 (BM)) resemble it most closely.

The original spelling, *buckleii*, was correct until recently according to the *International Code of Botanical Nomenclature* (Art. 73.1), as Curtis's latinization of Buckley was clearly intentional. There was therefore no alternative to rejecting the usual spelling, *buckleyi*, *pace* Adams (1962: 37); and I adopted the form *buckleii* in *The New Royal Horticultural Society Dictionary of Gardening* (Robson, 1992), *European Garden Flora* (Robson, 1995)[5] and various herbarium labels; and Wilbur (1995) also pointed out this necessary change. In the new (Tokyo) edition of the I.C.B.N. (1994), however, spellings of epithets based on latinizations of modern names have been prohibited retrospectively (Art. 60.11), so the form *buckleyi* is now the obligate one. Barker & Cheek (1994) reached the same conclusion; but their statement that the leaves of *H. buckleyi* have black glandular dots is erroneous.

[5] But my last-minute attempt to correct the spelling resulted in the publication of another variant: *buckleiyi*.

Subsect. 3. **Suturosperma** R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 214 (1893).

Isophyllum Spach, *Hist. nat. vég.* Phan. **5**: 432 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 367 (1836), non *Isophyllum* Hoffman (1814). Type: *I. drummondii* Spach (= *Hypericum microsepalum* (Torrey & Gray) A. Gray ex S. Watson).

Ascyrum b. *Isophyllum* (Spach) Endl., *Gen. pl.*: 1032 (1840) status ignot.

Crookea Small, *Fl. s.e. U.S.*: 786, 1335 (1903). Type: *C. microsepala* (Torrey & Gray) Small (= *Hypericum microsepalum* (Torrey & Gray) A. Gray ex S. Watson).

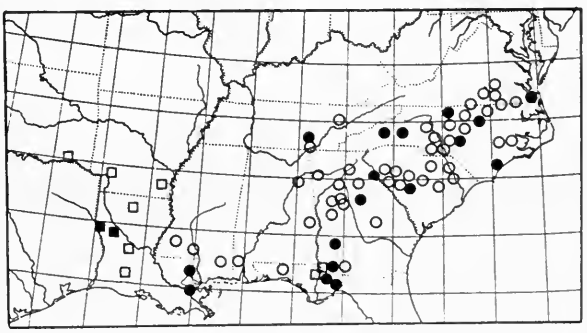
Hypericum sect. *Isophyllum* (Spach) W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 36 (1962), nom. synon.

Shrubs or perennial herbs with leaves not articulated at base, persistent or deciduous above base; inflorescence-branching dichasial, mainly acropetal; petals 5 (4–3); stamens 30–95, deciduous (Spp. 16, 17) or persistent; styles and placentae 3(4), placentation incompletely axile (Spp. 16, 17) or ± parietal. Species 16–22.

16. **Hypericum apocynifolium** Small in *Bull. Torrey bot. Club* **25**: 616 (1898), *Fl. s.e. U.S.*: 788 (1903), *Man. s.e. fl.*: 871 (1933); Svenson in *Rhodora* **42**: 15 (1940) pro parte, excl. spec. Harper.; W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 37 (1962); Correll & Johnson, *Man. vasc. pls Texas*: 1064 (1970); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 371, f. 179e–g (1988). Type: U.S.A., Arkansas, Miller Co., Texarkana, August 1897 (fl & fr), *Heller* s.n. (NY-lectotype, Svenson 1940); without precise locality, *Leavenworth* s.n. (NY-syntype). Small refers to Texarkana specimens without mentioning Heller, which is probably why Svenson merely 'suspects' it to be the type. Both refer to the Leavenworth specimens from Arkansas (*H. nudiflorum* var. β sensu Torrey & Gray) as additional material. Svenson (1940) may thus be said to have lectotypified *H. apocynifolium* Small; but, in any case, Adams (1962) definitely states that the Heller specimen is the lectotype.

Map 9.

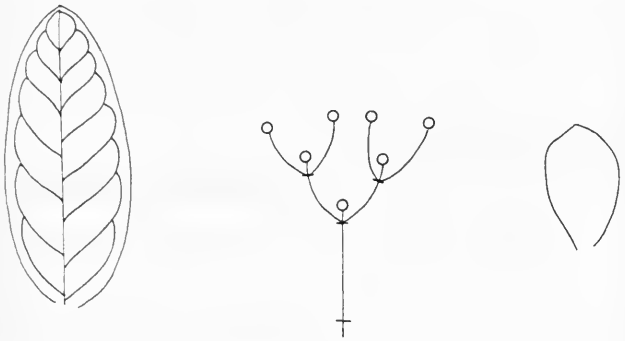
H. nudiflorum [var.] β sensu Torrey & Gray, *Fl. N. Amer.* **1**: 162 (1838).



Map 9 Sect. 20: 16. *H. apocynifolium* ■ specimens, □ records; 17. *H. nudiflorum* ● specimens, ○ records.

H. nudiflorum sensu R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 754 (1960); W.P. Adams in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Clewell, *Guide vasc. pls Florida Panhandle*: 370 (1985) pro parte omnes quoad syn. *H. apocynifolium*; et auct. plur.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 371, f. 179e–g (1988).



Shrub 0.4–0.7 m tall (or taller?), erect, with branches ascending. *Stems* orange-brown, narrowly 4-winged at first, eventually 2-lined, cortex exfoliating in strips, exposing red bark; bark turning brown. *Leaves* bright green, subsessile or shortly broadly petiolate (to 1 mm), 20–40 × 12–20 mm, oblong to elliptic-oblong, with margin plane or rarely recurved, paler or ± glaucous beneath, ± thinly chartaceous, eventually deciduous at lamina base, apex rounded to retuse, base ± broadly cuneate; venation: *c.* 6 pairs main laterals without intermediates, tertiary reticulation obscure; usually only midrib prominent; laminar glands small, dense. *Inflorescence* (1)3–5(–8)-flowered, terminal, without accessory flowers; pedicels 3–10 mm long; bracts 1.5–3 mm long, triangular-subulate. *Flowers c.* 15 mm in diam.; buds globose. *Sepals* 5, 3–5 × 1.5–2.3 m, unequal, tardily deciduous, spathulate to elliptic or ovate, rounded to acute, margin plane, basal veins (1)3, unbranched. *Petals* 5, coppery yellow, 8–10 × 4–6 mm, *c.* 2 × sepals, oblong, with apiculus lateral, acute, very short. *Stamens c.* 60–80, longest 4–6 mm, 0.65–0.75 × petals, deciduous. *Ovary* 3-merous, *c.* 3 × 1.5 mm, ellipsoid, subacute, placentation incompletely axile; styles 3, 1–1.5 mm long, *c.* 0.5 × ovary. *Capsule* 6–15 × 4.5–7(–8) mm, cylindric-conic, acute, longer than sepals, thickly coriaceous. *Seeds* dull brown to blackish, 1.8–2 mm long, with low ridge; testa finely scalariform-reticulate.

Stream banks and moist woods; coastal plain and lower Mississippi valley.

U.S.A. (scattered localities in south-eastern Oklahoma, southern Arkansas, western Texas and western Louisiana; also (?) in extreme south-western Georgia and Florida).

U.S.A. Arkansas: *Drew Co., Monticello, *Demaree* 16231 (NY); *Miller Co., 10 June 1898 (fl), *Eggert* s.n. (MO). Florida: *Gadsden Co., Aspalaga, *Godfrey* 53612 (DUKE, FSU, NCSC). Louisiana: Natchitoches Par., Natchitoches, 14 June 1915 (e. fr), *Palmer* 8009 (K); De Soto Par., 3.2 km W. of Hunter, 10 August 1938 (fr), *Correll & Correll* 10178 (DUKE*, GH). Oklahoma: *Choctaw Co., *Leavenworth* s.n. (NY). Texas: without precise locality, n.d. (fr), *Wright* s.n. (K).

According to Adams (1962), *H. apocynifolium* cannot be distinguished vegetatively from 17. *H. nudiflorum*. The few-flowered inflorescence, larger flowers with relatively longer sepals, larger, thicker-walled capsules and seeds with a ridge (not a keel), however, all seem to be constant distinguishing characters of *H. apocynifolium*, and all indicate an evolutionary position between *2. H. prolificum* and 17. *H. nudiflorum*. I therefore prefer to regard it as a distinct species, as did Adams at first (although not later – Adams, 1973), rather than include it in *H. nudiflorum*. Adams recorded *H. apocynifolium* from the Flint River drainage in extreme south-west Georgia and the Apalachicola River bluffs in Gadsden Co., Florida; but specimens from those regions that I have seen belong to *H. nudiflorum*.

H. apocynifolium is most closely related to a form of *H. prolificum* from Tennessee. It and *H. nudiflorum* are intermediate between that species and the *H. cistifolium* group (Spp. 18–21).

17. **Hypericum nudiflorum** Michx. ex Willd., *Sp. pl.* **3**: 1456 (1802); Michx., *Fl. bor.-amer.* **2**: 78 (1803); Pursh, *Fl. Amer. sept.* **2**: 375 (1814); Elliott, *Sketch bot. S. Carolina* **2**: 32 (1821); Choisy, *Prod. monogr. Hypéric.*: 46 (1821), in DC., *Prodr.* **1**: 548 (1824) pro parte excl. syn. Aiton; Hook. & Arn. in *Hook. J. Bot.* **1**: 199 (1834) incl. var.; Torrey & Gray, *Fl. N. Amer.* **1**: 162 (1838) excl. [var.] β; Darby, *Man. Bot.* **2**: 35 (1841) ['*mediflorum*']; A. Gray, *Man. Bot.*: 53 (1848); Chapm., *Fl. South. U.S.*: 41 (1865); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 128 (1878); Coulter in A. Gray, *Syn. fl. N. Amer.* **1**: 287 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Small, *Man. s.e. fl.*: 871 (1933); Svenson in *Rhodora* **42**: 18 (1940); Rehd., *Man. cult. trees* 2nd ed.: 640 (1940); J.P. Gillespie in *Castanea* **24**: 29 (1958); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 764 (1960); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 36 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973) pro parte, excl. syn. *H. apocynifolium*; Radford, Ahles & Bell, *Man. vasc. Fl. Carolinas*: 713 (1968); Correll & Johnston, *Man. vasc. pls Texas*: 1064 (1970); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 348 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985) pro parte, excl. syn. *H. apocynifolium*; Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 371, f. 179 a–d (1988). Type: U.S.A., S. Carolina, Berkeley Co., 'Goose Creek & Ga[nnet?] place', n.d. (fr), *Michaux* s.n. (P-holotype, BM!-microfiche; G-photograph).
Fig. 17A, Map 9.

H. ligustrinum Pursh, *Fl. Amer. sept.* **2**: 375 (1814), in synon.

H. nudiflorum [var.] β *ovatum* Choisy in DC., *Prodr.* **1**: 548 (1824). Type: U.S.A., S. Carolina, Car. meridionale, *Fraser* s.n. (G-DC!).

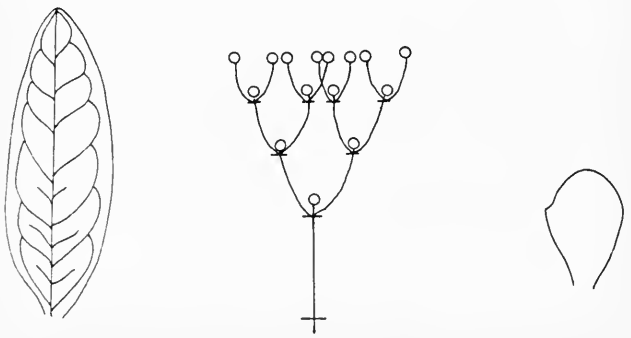
?*H. nudiflorum* [var.] γ *ramosum* Choisy in DC., *Prodr.* **1**: 548 (1824). Type not seen; not in Herb. DC.

Myriandra nudiflora (Michx. ex Willd.) Spach, *Hist. nat. vég.* Phan. **5**: 440 (1836), in *Ann. Sci. nat.* (Bot.) II, **5**: 365 (1836).

Brathydium nudiflorum (Michx. ex Willd.) K. Koch, *Hort. dendrol.*: 67 (1853).

Hypericum cistifolium sensu Coulter in *Bot. Gaz.* **11**: 86 (1886) pro parte excl. typum.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 371, f. 179a–d (1988).



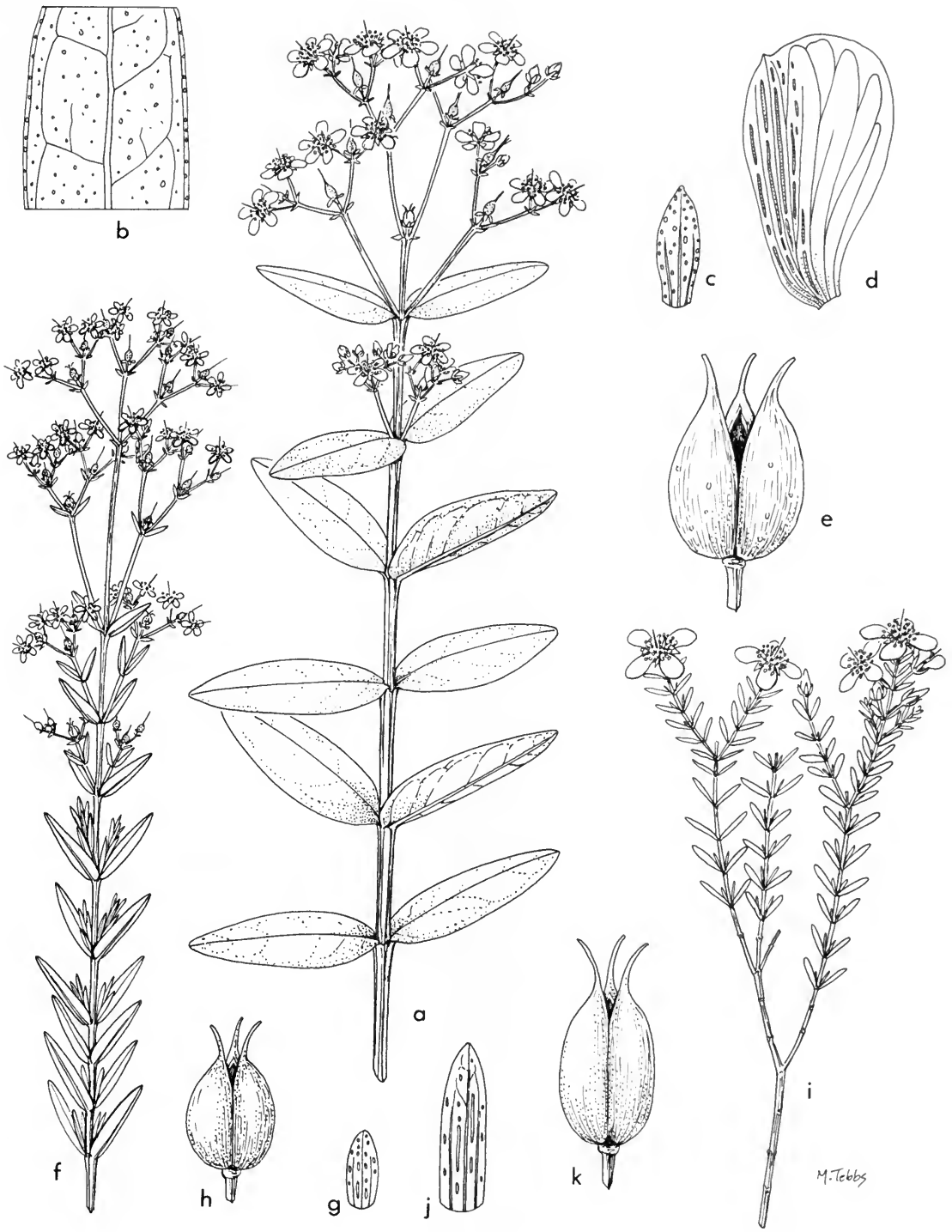


Fig. 17 A. *H. nudiflorum*: (a) habit; (b) leaf (part); (c) sepal; (d) petal; (e) capsule. B. *H. cistifolium*: (f) habit; (g) sepal; (h) capsule. C. *H. microsepalum*: (i) habit: (j) sepal; (k) capsule (a, f, i × ½; c × 2; b, d, e, g, h, j, k × 4). A. *Herb. Biltmore* 1272b. B. *Boufford* et al. 23046. C. *Chapman* s.n.

Shrub 0.5–2 m tall, erect, usually loosely branched, with branches ascending. *Stems* narrowly 4-winged at first, eventually terete, subherbaceous above, becoming brown and woody at base; cortex exfoliating in strips; bark brown. *Leaves* pale green, subsessile or shortly and broadly petiolate (to 2 mm long); lamina 30–70 × 7–25 mm, ovate-lanceolate or elliptic to linear-oblong, with margin plane and very narrowly pellucid, not or rarely slightly glaucous, thinly chartaceous, deciduous at lamina base, apex obtuse to rounded, base cuneate to subcordate; venation: *c.* 6 pairs main laterals and sometimes intermediates, tertiary reticulation obscure; only midrib prominent; laminar glands dense. *Inflorescence* 7–*c.* 45-flowered, without accessory flowers, sometimes with 1–7(–*c.* 40)-flowered dichasia from 1–3 nodes below, the whole corymbiform or sometimes rounded-pyramidal; pedicels 1.5–4 mm long; bracts *c.* 1.5–3 mm long, triangular-subulate. *Flowers* 15–20 mm in diam.; buds ellipsoid, rounded. *Sepals* 5, 2–5 × 1–1.5 mm, unequal to subequal, deciduous, oblanceolate-spathulate or oblong-elliptic to narrowly triangular, obtuse to acute, margins plane, basal veins 3, unbranched. *Petals* 5, pale or coppery yellow, 6–8 × 3–4 mm, 2.5–3 × sepals, oblanceolate-oblong to elliptic-oblong, with apiculus lateral, acute, short. *Stamens c.* 80, longest 4–5 mm, 0.7–0.8 × petals, deciduous. *Ovary* 3(4)-merous, *c.* 3 × 1 mm, very narrowly ovoid-ellipsoid, acute, placentation parietal; styles 3(4), *c.* 3 mm long, about equalling ovary, remaining appressed in fruit. *Capsule* 3.5–7 × 3–5 mm, broadly ellipsoid to ovoid-globose, acute. *Seeds* 1.5–2 mm long, black, carinate, conspicuously curved (*fide* Adams, 1959); testa ± scalariform-reticulate. 2n = 18 (n = 9, Hoar & Haertl, 1932).

Stream banks, moist woodland (deciduous and pinelands) and swamps, on sand; lowland and plateau (to *c.* 1000 m).

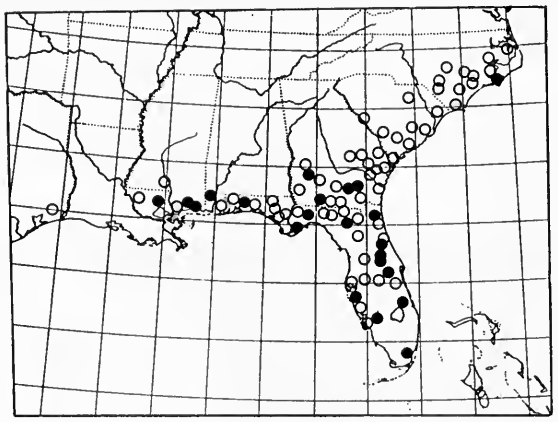
U.S.A. (Virginia to E. Tennessee, south to NW Florida and west to SE Louisiana and Texas).

U.S.A. Alabama: no precise locality, 1832 (fl & fr), *Drummond* s.n. (K); *Etowah Co., Gadsden, *Vasey* 385 (F, GH, NY, PH, US). Florida: Wakulla Co., prope St Marks, June 1843 (fl), *Rugel* 466 (BM, G, K); Wakulla Co., between Bloxham and Sopchoppy, 25 June 1958 (fl), *Godfrey* 57135 (BM, FSU*,GH*). Georgia: Clarke Co., SE of Athens, River Bend East road, 28 June 1979 (fl & fr), *Jones* 23296 (BM, G, GH*); Lee Co., Mill Creek, 13 July 1901 (e. fr), *Harper* 1073 (BM, MO*). Louisiana: New Orleans Par., New Orleans, n.d. (fr), '*Hooker*' s.n. (probably coll. *Drummond*) (K); St.Tammany Par., Covington, 1832 (fr), *Drummond* 319 (BM, K). Mississippi: *Stone Co., 0.4 km S. of McHenry, *Diener* 378 (MISSA, TULANE). North Carolina: Burke Co., Table Rock Mtn, 9 August 1909 (fr), *Herb. Biltmore* 1001 (G); Chatham Co., 4.8 km S. of Wilsonville, 1 July 1966 (fl), *Pence* in *Radford* 44838 (BM, H); Davie Co., near Farmington, 3 July 1897 (fr), *Herb. Biltmore* 1272d (JE). South Carolina: Richland Co., Congaree R., 19 June 1855 (fl & e. fr), *Hexamer & Maier* s.n. (BM); *Abbeville Co., 8 km SW of Antreville, *Radford* 26052 (UNC); see also type. Tennessee: Grundy Co., near Beersheba Springs, 1 August 1947 (e. fr), *Sharp, Shanks & Clebsch* 5144 (BM); *Sequatchie Co., W. of Dunlap, 510 m, 14 July 1938 (fl & fr), *Svenson* 9554 (BKL, DUKE, MO, PH, TENN). Virginia: Princess Anne Co., Macon's Corner, 8 September 1935 (fr), *Fernald & Long* 4943 (A*, BKL*, GH*, K, NY*, US*); *Sussex Co., terrace of Nottoway R., *c.* 5 km NNW of Bethel Church, 9 September 1946 (fr), *Fernald, Long & Clement* 15307 (MO).

Correll & Johnston (1970) record *H. nudiflorum* from eastern Texas as well as *H. apocynifolium*; but I have seen no specimens from there, and Adams (1962) did not include Texas in the distribution of this species. He likewise failed to record it from Louisiana, although there are early-nineteenth-century specimens from there, which suggests that it may now be extinct in that state.

H. nudiflorum is morphologically intermediate between *H. apocynifolium* and *H. cistifolium*. For differentia see these species.

Rehder (1911) observed pistillody in *H. nudiflorum*. There were *c.* 3–10 sterile structures per flower, situated between pistil and stamens and mostly boat-shaped. They differed in size and bore ovules, rarely except the upper ones. Stamen tissue was often present, but true anthers were rare.



Map 10 Sect. 20: 18. *H. cistifolium* ● specimens, ○ records.

18. **Hypericum cistifolium** Lam., *Encycl.* **4**: 158 (1797); Choisy, *Prodr. monogr. Hypéric.*: 45 (1821), in DC., *Prodr.* **1**: 547 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 673 (1840); Chapm., *Fl. South. U.S.*: 41 (1865); S. Watson, *Bibliogr. index N. Amer. bot.*: 125 (1878) pro parte, excl. syn. *H. nudiflorum*; Coulter in A. Gray, *Syn. fl. N. Amer.* **1**: 287 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Svenson in *Rhodora* **42**: 17 (1940); Rehd., *Man. cult. trees* 2nd ed.: 640 (1940); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 756 (1960); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 38 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 70 (1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 713 (1968); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); R. Long & Lakela, *Fl. Trop. Florida*: 607 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots.: 348 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 371 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 369, f. 178 (1988); N. Robson in *Eur. Gdn Fl.* **4**: 69, ff. 10.6, 10.12 (1995) ['*H. cistiflorum*']. Type: U.S.A., no precise locality or collector (P-LA-holotype; GH-photograph). Fig. 17B, Map 10.

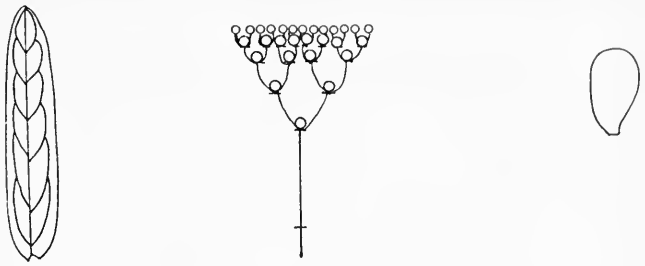
H. rosmarinifolium Lam., *Encycl.* **4**: 159 (1797); Willd., *Sp. pl.* **3**: 1450 (1802); Choisy, *Prodr. monogr. Hypéric.*: 45 (1821), in DC., *Prodr.* **1**: 547 (1824); S. Watson, *Bibl. index N. Amer. bot.* **1**: 456 (1878); Coulter in A. Gray, *Syn. fl. N. Amer.* **1**: 287 (1897) pro parte, excl. syn. *H. sphaerocarpum*. Type: U.S.A., Carolina, *Fraser* s.n. (P-LA-holotype).

Brathydium hyssopifolium Spach, *Hist. nat. vég.* Phan. **5**: 445 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836); K. Koch, *Hort. dendrol.*: 67 (1853), nom. illegit. (Art. 63). Type as for *H. cistifolium* Lam.

Hypericum opacum Torrey & Gray, *Fl. N. Amer.* **1**: 163 (1838); Coulter in *Bot. Gaz.* **11**: 87 (1886), in A. Gray, *Syn. Fl. N. Amer.* **1**: 287 (1897); Sargent in *Gdn Forest* **5**: 304 & t. (1892); Small, *Man. s.e. fl.*: 871 (1933). Type: U.S.A., Georgia, *Mrs Miller* s.n. (GH-syntype?); Georgia, *Dr Loomis* s.n. (GH-syntype?); Alabama, *Dr Gates s.n.* (GH-lectotype, selected here).

H. punctulosum Bertol., *Misc. Bot.* **13**: 18, t. 3 f. 2d–e (1853). Type: U.S.A., Alabama, *Dr Gates* s.n. (GH-holotype?). Bertolini's collection at BOLO does not contain an appropriate Gates specimen, judging from the microfiche set.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 369, f. 178 (1988).



Shrub (or subshrub), *c.* 0.5–1.3 m tall, erect, unbranched or with leaf clusters or short branches from most nodes and sometimes 1–3 ascending branches from lower half of stem. *Stems* red-brown, 4-lined, the subfoliar lines more prominent or wing-like, becoming terete below; cortex exfoliating in strips; bark reddish brown. *Leaves* sessile, 15–40 × (2–)4–8(–10) mm, narrowly oblong or narrowly elliptic-oblong to triangular-lanceolate, with margin recurved, densely glaucous beneath, thinly coriaceous, deciduous above base, apex subacute to rounded, base subcordate to cuneate; venation: one pair of ascending near-basal laterals and *c.* 4–5 pairs of obscure laterals, only midrib prominent the rest often invisible externally; laminar glands small, dense. *Inflorescence* (7–)15–*c.* 65-flowered, of regular dichasia, dense, without accessory flowers, sometimes with 3–*c.* 65-flowered dichasia from 1–2 nodes below and short flowering branches from a further 1–4 nodes, the whole corymbiform (often rounded) to cylindric; pedicels 1–3 mm long; bracts 2–10 mm long, subulate. *Flowers* 7–12 mm in diam., buds ellipsoid, acute. *Sepals* 5, 2–4 × 1–1.8 mm, unequal, persistent, obovate or broadly elliptic to oblong, rounded, margin plane, basal veins 3(–5?), unbranched. *Petals* 5, bright yellow, 5–8 × 2.5–3 mm, 2 × sepals, oblanceolate, with apiculus lateral, obtuse, short. *Stamens c.* 30–50, longest 3.5–4.5 mm, 0.6–0.7 × petals, at least some persistent at least until fruit matures. *Ovary* 3-merous, 1.5–2.5 × 1–1.2 mm, narrowly ovoid-conic, obtuse, 3-lobed with valvular depressions, placentation parietal; styles 3, 1–2 mm, 0.7–0.8 × ovary, remaining appressed in fruit. *Capsule* 4–6 × 3–4 mm, ovoid-cylindric to ovoid-subglobose, obtuse to rounded, 3-lobed by depressions between carpel margins. *Seeds* mustard-yellow, 0.5 mm long, ecarinate; testa foveolate-reticulate to linear-foveolate. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Moist soil in pine flatwoods, bogs, swamp and marsh margins, ditches and roadside embankments, on sand; lowland.

U.S.A., coastal plain from North Carolina to Louisiana.

U.S.A. Alabama: Baldwin Co., *fide* Clark (1971) and Adams (1959: 13); Mobile Co., Mobile, 1840 (fl), *Gray* s.n. (K); *Pike Co., Spring Hill, 1919 (fl & fr), *Graves* s.n. (MO). Florida: Duval Co., near Jacksonville, August (fl & fr), *Curtiss* 253 (BM, F*, FR, GH*, K, MO*, PH*, US*); Lake Co., *c.* 6.4 km N. of Altoona, 2 August 1960 (fr), *Adams* 603 (K); Orange Co., near Taft, 1 June 1952 (fl), *Schallert* 4037 (BM, K). Georgia: Brantley Co., *c.* 16 km E. of Waycross, near Highbluff Church, 29 August 1960 (fr), *Kuns* 261 (WIS); Pierce Co., *Logue & Bozeman* 2136 (BM, H). Louisiana: St Tammany Par., Covington, 1832 (fl), *Drummond* 135 (BM, K); *Tangipahoa Par., 3.2 km W. of Robert, *Correll* 10511 (F, GH, NY, PH). Mississippi: *Harrison Co., Biloxi, 25 July 1896 (fl & fr), *Pollard* 1002 (F, GH, MO, NY, US); Jackson Co., N. of Ocean Springs, 20 July 1952 (fr), *Demaree* 32427 (BM). North Carolina: Onslow Co., SE of Dixon, 7.1 km S. of U.S. 17 on N.C. 210, 24 August 1979 (fl & e. fr), *Boufford* 21552 (BM; CM*); Tyrrell Co., near N.C. 94, 0.8 km S. of Kilkenny, 6 August 1959 (fl), *Radford* 39250 (K). South Carolina: *Charleston Co., 8 km NW of McClellanville, 4 August 1939 (fl & fr), *Godfrey & Tryon* 1114 (DUKE, F, GH, MICH, NY, PH, TENN). Texas: *Hardin Co., Honey Island, Village Mills, 31.5 m, 25 September 1987 (fr), *Orzell & Bridges* 5806 (MO).

Adams (1962), following Torrey & Gray (1838), remarked on the capsules of *H. cistifolium* being lobed due to *dorsal* (not the usual lateral) compression of the three valves. In this they contrast with the unlobed globose capsules of *H. sphaerocarpum*.

Torrey & Gray (1838: 163) originally omitted *H. cistifolium*, describing it as a new species, *H. opacum* Torrey & Gray. Although they realized their mistake on seeing Lamarck's type of *H. cistifolium* and corrected it (Torrey & Gray, 1840: 673), the name *H. opacum* remained current in the American literature until Svenson (1940) explained the situation. As a result of this confusion, Coulter (1886*a*) regarded *H. cistifolium* as a later homonym of *H. nudiflorum* Michx. ex Willd.

H. cistifolium is closely related to 18. *H. sphaerocarpum*, having a more south-eastern distribution. The species can be distinguished by leaf size, sepal size and fruit shape.

19. **Hypericum microsepalum** (Torrey & Gray) A. Gray ex S. Watson, *Bibliogr index N. Amer. bot.* **1**: 456 (1878); Coulter in *Bot. Gaz.* **11**: 82 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 284 (1897); Adams & Robson in *Rhodora* **63**: 15 (1961); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 43 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 341 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 352, f. 166 (1988). Type as for *Ascyrum microsepalum* Torrey & Gray.

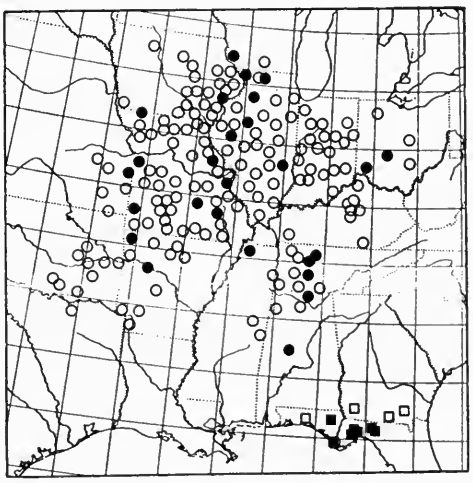
Fig. 17C, Map 11.

Isophyllum drummondii Spach, *Hist. nat. vég.* Phan. **5**: 433 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 367 (1836), non *Hypericum drummondii* (Grev. & Hook.) Torrey & Gray (1838). Type: U.S.A., Florida, Franklin Co., prope Apalachicola, 1836 (fl), *Drummond* 8 (P-holotype; BM!, GH, K!, W!). Adams (1962: 43) wrongly stated that *Sarothra drummondii* Grev. & Hook. was the basionym of this name. It is in fact the basionym of *Hypericum drummondii* (Grev. & Hook.) Torrey & Gray (sect. *Brathys*).

Ascyrum microsepalum Torrey & Gray, *Fl. N. Amer.* **1**: 157 (1838); A. Gray, *Gen. Amer. bor.* **1**: 212 (1848); Chapm., *Fl. South. U.S.*: 39 (1865). Type: U.S.A., Florida, 'Middle Florida', *Dr Alexander* (NY-lectotype, selected here); Georgia, without precise locality, *?* (NY-syntype).

Hypericum isophyllum Steud., *Nomencl.* 2nd ed. **1**: 788 (1840), nom. illegit. (Art. 63).

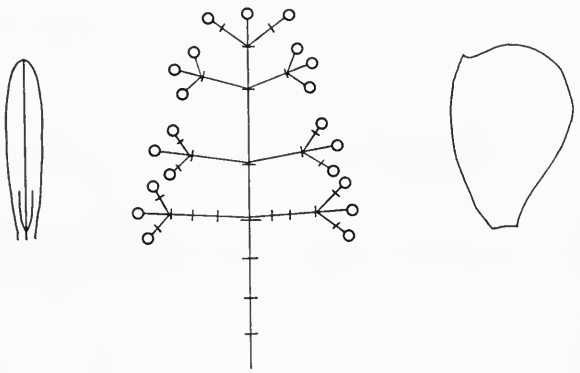
Brathydium microsepalum (Torrey & Gray) K. Koch, *Hort. dendrol.*: 67 (1853).



Map 11 Sect. 20: 19. *H. microsepalum* ■ specimens, □ records; 20. *H. sphaerocarpum* ● specimens, ○ records.

Crookea microsepala (Torrey & Gray) Small, *Fl. s.e. U.S.*: 786, 1335 (1903), *Man. s.e. fl.*: 868 (1933).

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 352, f. 166 (1988).



Shrub 0.15–0.7 m tall (or long), erect or more usually decumbent or ascending, with branches numerous, straggling or ascending. *Stems* reddish brown, 4-lined and ancipitous when young, eventually 2-lined; cortex exfoliating in strips; bark red-brown. *Leaves* sessile, 5–10(–15) × 1–3 mm, narrowly oblong or oblanceolate to linear, with margin recurved to subrevolute, paler beneath, thinly coriaceous, deciduous above base, apex rounded to obtuse, base rounded to (usually) cuneate; venation obscure: 1–3 pairs of lateral veins; laminar glands dense to sparse. *Inflorescence* 1–3-flowered, without accessory flowers, sometimes with single flowers or triads or flowering branches from up to 4 nodes below, the whole rounded-pyramidal; pedicels 5–9 mm long; bracts reduced foliar. *Flowers* 15–25 mm in diam., buds ovoid, acute. *Sepals* (3)4(5), 3–5 × 1–1.4 mm, persistent, subequal or (when 5) equal, oblong or elliptic to linear, obtuse to acute, margin plane, basal veins 3, unbranched. *Petals* (3)4(5), bright yellow, 10–12 × 6–9 mm, 2–2.5 × sepals, unequal or (when 5) subequal, when 4 the larger pair obovate and smaller pair obovate-oblong, with apiculus lateral, obtuse, short. *Stamens* 60–70, longest *c.* 6 mm, *c.* 0.5 × petals. *Ovary* 3-merous, 3–3.5 × 1.2 mm, narrowly ellipsoid, scarcely lobed, placentation parietal; styles 3.3 mm long, 0.85–1 × ovary, sometimes separating in fruit. *Capsule* 6–8 × *c.* 2.5 mm, cylindric-ellipsoid to cylindric or narrowly ovoid-conic, acute to obtuse. *Seeds* dark brown, *c.* 0.9–1 mm long; testa linear-foveolate. 2n = 18 (Lewis, Stripling & Ross, 1962; n = 9, Adams in Robson & Adams, 1968).

Low pine flatwoods, moist to wet, on sand; lowland.

U.S.A. Northern Florida (Panhandle from Walton to Lafayette counties) and adjacent Georgia.

U.S.A Florida: Gadsden Co., Lawrence, 15 March 1940, *Harper* 129 (K); Jefferson Co., N. side of Aucilla R., S. of Lamont, 6 April 1960 (fl), *Dress & Hanson* in *Bailey* 2022 (BM, G); Wakulla Co., vicinity of Crawfordsville, Apalachicola National forest, 27 February 1971 (fl), *Godfrey* 70178 (H). Georgia: Atkinson Co., *fide* Adams (1962: 43); *Brooks Co., 15 April 1892 (fl & fr), *Lighthipe* s.n. (MO); Calhoun Co., *fide* Adams (1962: 43); *Lowndes Co., 2.4 km W. of Dasher and *c.* 11 km S. of Valdosta, 20 February 1965 (fl), *Faircloth* 1655 (MO).

Although *H. microsepalum* typically has a tetramerous perianth, Adams (1962) pointed out that the perianth of some flowers on many plants may be pentamerous, or a pair of sepals and/or petals may be partially united (Adams & Robson, 1961). In such flowers the differences in sepal and petal size are almost absent. *H. microsepalum* is thus clearly in a transitional stage between *Hypericum* proper and '*Ascyrum*'; but it does not bear a close resemblance to the other members of '*Ascyrum*'. For example, the pairs of sepals are almost equal, a feature that induced Spach (1836*a, b*) to distinguish it as *Isophyllum*.

Whereas *Ascyrum* proper (Spp. 25–29) appears to be derived from 1. *H. frondosum*, the nearest relative of *H. microsepalum* would seem to be 17. *H. cistifolium*. Indeed, all the characters of *H. microsepalum* can be considered as reduced states of those of *H. cistifolium*, except the much larger petals. Geographically, the distribution of *H. microsepalum* falls within that of *H. cistifolium*; and so it is apparently a neo-endemic, maintained as a distinct species by some biological factor, possibly different pollinators attracted by the different size of flower. Adams's comment that *H. microsepalum* flowers earlier than other species (mainly February to late April but sporadically in May and November) may be relevent in this regard.

20. **Hypericum sphaerocarpum** Michx., *Fl. bor.-amer.* **2**: 78 (1803); Pursh, *Fl. Amer. sept.* **2**: 378 (1814); Poir., *Encycl.* Suppl. **3**: 1697 (1814) ['*sphaerocarpon*']; Choisy, *Prodr. Monogr. Hypéric.*: 46 (1821), in DC., *Prodr.* **1**: 548 (1824) ['*sphaerocarpon*']; Torrey & Gray, *Fl. N. Amer.* **1**: 163 (1838) ['*sphaerocarpon*']; A. Gray, *Man. Bot. n. U.S.*: 53 (1848); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 129 (1878); Coulter in *Bot. Gaz.* **11**: 87 (1886); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Small, *Man. s.e. fl.*: 871 (1933); Svenson in *Rhodora* **42**: 17 (1940); Gleason, *New Britton & Brown Ill. Fl.* **2**: 540 (1952); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 39 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Steyermark, *Fl. Missouri*: 1064 (1970); Utech & Iltis in *Trans Wis. Acad. Sci. Arts Lett.* **58**: 363, map 3 (1970); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 42 (1978); Cooperrider in *Castanea* **54**: 7, f. 1 (1989). Type: U.S.A., Kentucky, 'Hab. in Kentucky. Route de Louisville', n.d. (fl), *Michaux* s.n. (P-holotype, A-photograph, BM!-microfiche; GH-sketch).

Map 11.

H. nudiflorum sensu Rchb., *Icon. Bot. Exot.*: 60, t. 87 (1827).

Brathydium sphaerocarpum (Michx.) Spach, *Hist. nat. vég.* Phan. **5**: 444 (1836); K. Koch, *Hort. dendrol.*: 67 (1853).

B. chamaenerium Spach, *Hist. nat. vég.* Phan. **5**: 445 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836). Type: U.S.A., Ohio, *Herb. Moser* (P-holotype); in ditione 'Miami' civitatis Ohio, 1835 (fl), *Frank* s.n. (BM!, K!).

B. chamaerinum Steudel, *Nomencl.* 2nd ed. **1**: 224 (1840), sphalm.

Hypericum chamaenerium (Spach) Steud., *Nomencl.* 2nd ed. **1**: 787 (1840).

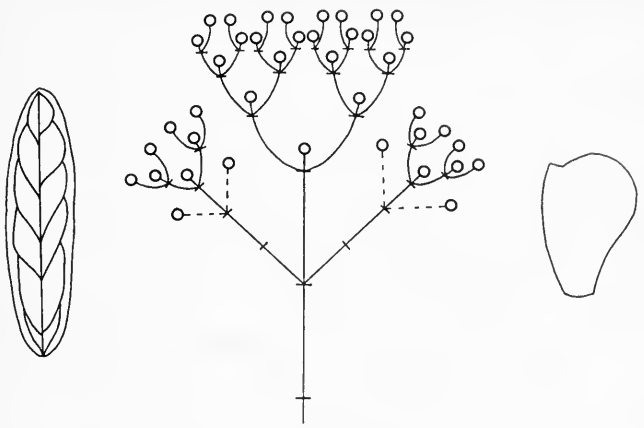
H. cistifolium sensu Coulter in A. Gray, *Syn. fl. N. Amer.* **1**: 287 (1897); Small, *Man. s.e. fl.*: 871 (1933); pro parte uterque excl. typum.

H. sphaerocarpum Michx. var. *sphaerocarpum* Svenson in *Rhodora* **42**: 17 (1940), autonym; J.P. Gillespie in *Castanea* **24**: 29 (1958); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 43, f. 18 (1978).

H. turgidum Small, *Fl. s.e. U.S.*: 788 (1903), *Man. s.e. fl.*: 871 (1933); Harper in *Geol. Surv. Ala. Monogr.* **9**: 273 (1928); Rehd., *Man. cult. trees* 2nd ed.: 640 (1940). Type: Alabama, Madison Co., between Huntsville and Summerville, 7 October 1897 (fr), *Canby* 14 (NY-holotype; MO-isotype).

H. sphaerocarpum var. *turgidum* (Small) Svenson in *Rhodora* **42**: 17 (1940); J.P. Gillespie in *Castanea* **24**: 29 (1958); Mohlenbr. & Evans in *Rhodora* **74**: 146 (1972); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 43, f. 19 (1978).

Icones: Rchb., *Icon. Bot. Exot.*: t. 87 (1827); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 44–45, ff. 18, 19 (1978).



Subshrub (stems woody at base) or rhizomatous perennial herb, 0.22–0.58 m tall, erect or decumbent, unbranched or with spreading to ascending branches from lower half of stem upwards. *Stem* red-brown, 2–4-lined, the subfoliar lines more prominent, not becoming terete; cortex exfoliating in strips. *Leaves* sessile, 30–70 × 3–15 mm, narrowly elliptic or narrowly oblong to linear, with margin plane to revolute, slightly to densely glaucous beneath, thinly coriaceous, persistent, apex obtuse (or sometimes subacute) to rounded, base narrowly cuneate to parallel; venation: 1 pair of ascending near-basal laterals and *c.* 4 pairs of obscure laterals or apparently 1-nerved, only midrib prominent; laminar glands dense, small. *Inflorescence* a *c.* 7–70-flowered regular dichasium without accessory flowers, sometimes with small dichasia from 1–2 nodes below and short flowering branches from up to a further 6 nodes, the main florescence rounded-corymbiform; pedicels absent or up to 1.5 mm long; bracts 2.5–5 mm long, triangular-lanceolate. *Flowers* (10–)12–15 mm in diam., buds broadly ovoid, apiculate. *Sepals* 5, 2.5–5 × 1.5–3 mm, persistent, somewhat unequal, broadly ovate to oblong-elliptic, obtuse to acute, margin often subrecurved, basal veins 3, unbranched. *Petals* 5, bright? yellow, 5–9 × 3–6 mm, 1.7–2 × sepals, oblanceolate-elliptic to elliptic, with apiculus lateral, apiculate. *Stamens* 45–85, longest 4.5–6.5 mm, 0.65–0.8 × petals, at least some persistent until fruit matures. *Ovary* 3-merous, 1.5–2 × 1–1.5 mm, ± broadly ovoid, not lobed, obtuse to acute, 1-locular with intruding placentae; styles 3, *c.* 4 mm, 2–2.5 × ovary, remaining appressed in fruit. *Capsule* 4.5–8 × 4–7 mm, broadly ovoid to depressed-globose, subapiculate to rounded. *Seeds* blackish brown, 2–2.7 mm long, carinate; 'coarsely reticulate'.

Barren embankments, wet or mesic prairies, limestone outcrops, cedar glades and sandy stream banks; lowland.

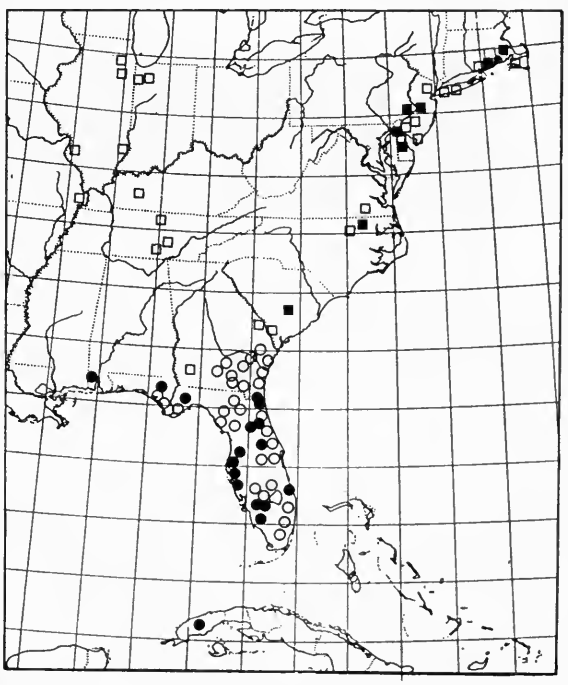
U.S.A., central basin from Iowa, Wisconsin and Ohio to Texas, Mississippi and Alabama; Florida?.

U.S.A. Alabama: Hale Co., *c.* 2.9 km S. of Greensboro by Ala 691, 29 May 1972 (fl), *Kral* 46840 (BM, MO); Madison Co., see type of *H. turgidum*; *Morgan Co., Valhermosa Mt., 28 September 1927 (fr), *Harper* 39 (A, GH, MO, NY, US). Arkansas: *Logan Co., 12 km SE of Paris, *Iltis* 5344 (MICH, SMU); Washington Co., Fayetteville, 6 July 1915 (fl), *Palmer* 8180 (K, MO). Illinois: ? Co., Beardstown, July 1842 (fl), *Geyer* s.n. (K); *Champaign Co., near Urbana, 3 July 1944 (fl), *Jones* 16445 (MO); Winnebago Co., Rosendal (Rockford), 12 July 1871 (fl), *Cervin* s.n. (H). Indiana: *Jasper Co., *c.* 5 km NW of junction of Roads 16 and 53, 13 July 1940 (fl & fr), *Friesner* 14557 (GA, MO, NY, UGA); *Know Co., Vincennes, 14 July 1935 (fl), *Hermann* 6603 (MO). Iowa: *Black Hawk Co., 20 July 1929 (fl), *Burk* 578 (MO); Scott Co., Davenport, Duck Creek, July 1886 (fl), *Fawcett* s.n. (BM). Kansas: *Hempstead Co., McNab, 19 September 1919 (fr), *Palmer* 16337 (MO); *Osage Co., *c.* 5 km S. of Lyndon, *Horr & Franklin* E323 (FLAS, IND, NCSC, SMU, US); Wilson Co., 1896 (fl & fr), *Haller* 631 (JE, MO). Kentucky: ? Co., Falls of Ohio, 1842 (fl), *Short* s.n. (BM, K); ? Co., banks of Kentucky R., July (fl), *Peter* s.n. (K). Mississippi: *Chicksaw Co., *Ray* 8548 (MISSA). Missouri: Jasper Co., Joplin, 6 July 1957 (fr), *Demaree* 39344 (BM); *Madison Co., Black Mountain, SW of Fredricktown, 4 October 1969 (fr), *D'Arcy* 3832 (MO); St. Francis Co., *c.* 9 km SE of Cadet, 20 July 1941 (fl & fr), *Meyer* 2088 (BM). Ohio: Franklin Co., Columbus, Scioto R., July (fl & fr), *Lesquereux* 29 (BM, K); Hamilton Co., Cincinnati, in ditione 'Miami' civitatis Ohio, 1835 (fl), *Frank* s.n. (BM, K). Oklahoma: *Garvin Co., near Brady, 29 July 1933 (fl & fr), *Palmer* 42056 (MO). Pennsylvania: *Alleghany Co., Glenshaw, 25 June 1921, *Bright* s.n. (CM). Tennessee: Bedford Co., 8 km N. of Shelbyville, 3 July 1958 (fl), *Adams* 71 (DUKE, F*, FSU*, IA*, IND*, MO*, TEX*, VPI*); Wilson Co., Lebanon State Park, 180 m, 22 June 1962 (fl), *Demaree* 45722 (BM). Texas: north-eastern Texas, *fide* Correll & Johnston (1970: 64). Wisconsin: Grant Co., 6.4 km NW of Cassville, 7 October 1972 (fl & fr), *Nee* 5366 (G).

Svenson (1940) recognized a narrow-leaved bushy-branched form of *H. sphaerocarpum* as a variety, var. *turgidum* (Small) Svenson, claiming that it has a well defined (southern) geographical distribution; and both varieties have been recorded from Tennessee (Gillespie, 1958) and Illinois (Mohlenbrock & Evans, 1972). The variation in *H. sphaerocarpum*, however, appears to be continuous, thus preventing the recognition of any varieties.

H. sphaerocarpum is related to both 17. *H. nudiflorum* and 18. *H. cistifolium*. It differs from both in being semi-herbaceous and in having a central rather than an eastern or south-eastern distribution, from *H. nudiflorum* in having narrower leaves, persistent sepals, smaller flowers and the capsule apex subapiculate to rounded, and from *H. cistifolium* in having longer leaves, larger flowers, broader and obtuse to acute sepals and broader capsules with much larger seeds.

21. **Hypericum adpressum** W.P.C. Barton, *Comp. Fl. Philadelph.* **2**: 15 (1818); Torrey & Gray, *Fl. N. Amer.* **1**: 159 (1838); Coulter in *Bot. Gaz.* **11**: 86 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 287 (1897); B.L. Rob. in *Rhodora* **4**: 136, ff. 5–9 (1902); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1935); Small, *Man. s.e. fl.*: 871 (1933); Svenson in *Rhodora* **42**: 18 (1940);



Map 12 Sect. 20: 21. *H. adpressum* ■ specimens, □ records (Kentucky record incompletely localized); 26. *H. tetrapetalum* ● specimens, ○ records.

Rehd., *Man. cult. trees* 2nd ed.: 640 (1940); J.P. Gillespie in *Castanea* **24**: 28 (1958); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 41 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Radford, Ahles & Bell, *Man. vasc. fl. Carolinas*: 715 (1968); Strasbaugh & Core, *Fl. W. Virginia* 2nd ed.: 638 (1973); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 33, f. 13 (1978); M.L. & R.G. Brown, *Herb. pls Maryland*: 644 (1984). Type: U.S.A., Pennsylvania, Montgomery Co., 'on the lower edge of Lansdown grounds, close to the Schuylkill, and not far above Breck's island', *c.* 1814, *Barton* s.n. (PH-holotype).

Map 12.

H. fastigiatum Elliot, *Sketch bot. S. Carolina* **2**: 31 (1821). Type: U.S.A., Georgia, Scriven Co., *Elliot* s.n. (CHARL-holotype).

H. bonaparteae W.P.C. Barton, *Fl. N. Amer.* **3**: 95, t. 106 (1823). Type as for *H. adpressum* W.P.C. Barton. Under both species, Barton cites *'Hypericun* No. 6. Bart. Fl. Philad.: 74 (1815)'.

H. adpressum var. *fastigiatum* (Elliot) Torrey & Gray, *Fl. N. Amer.* **1**: 673 (1840).

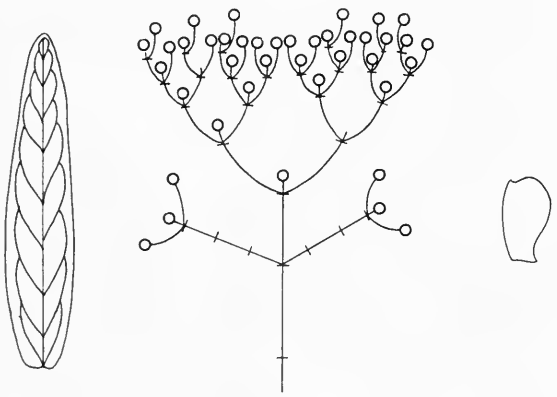
Myriandra adpressa (W.P.C. Barton) K. Koch, *Hort. dendrol.*: 66 (1853).

Brathydium fastigiatum (Elliot) K. Koch, *Hort. dendrol.*: 66 (1853).

Hypericun adpressum var. *spongiosum* B.L. Rob. in *Rhodora* **4**: 136, t. 37 ff. 10–11 (1902); Svenson in *Rhodora* **42**: 19 (1940). Type: U.S.A., Massachusetts, Bourne, Flax Pond, 15 September 1901 (fr), *Kennedy, Williams & Fernald* in *Pl. Exs. Gray.* 234 (GH!-holotype; BKL, BM!, F!, MICH, NCSC, PH, TENN, US!, Z!-isotypes).

H. adpressum forma *spongiosum* (B.L. Rob.) Fernald in *Rhodora* **51**: 112 (1949); Fernald in *Gray's Man. Bot.*: 1012 (1950); J.P. Gillespie in *Castanea* **24**: 28 (1958).

Icones: B.L. Rob. in *Rhodora* **4**: t. 37 ff. 5–11 (1902); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 34, f. 13 (1978).



Perennial herb, sometimes woody or spongy at base, (0.2–)0.4–0.8 m tall, erect from creeping rhizomatous base, unbranched until fruit matures or with 1(?2) pairs of branches below inflorescence and often axillary leaf clusters. *Stems* red-brown, 2-lined and ancipitous above, terete below. *Leaves* sessile, (15)30–75(–90) × 2–10 mm, narrowly oblong or linear to narrowly elliptic or lanceolate, with margin ± revolute, paler but not glaucous beneath, thinly coriaceous, persistent, apex acute, base narrowly cuneate to parallel, slightly decurrent; venation: *c.* 14 pairs main laterals, with subsidiaries almost equally strong and dense tertiary reticulation, midrib markedly prominent, main laterals less so; laminar glands dense, medium-sized. *Inflorescence c.* 13–60-flowered regular dichasia, without accessory flowers or subsidiary branches, rounded-corymbiform; pedicels 0.5–1.5 mm long; bracts 2–6 mm long, linear-lanceolate. *Flowers c.* 10–15 mm in diam., buds ellipsoid. *Sepals* 5, (2–)4–7 × 1–1.5 mm, persistent, subequal, ovate-lanceolate, acute, margin recurved, often ± deflexed, basal veins 3, unbranched. *Petals* 5, bright? yellow, 6–8 × *c.* 3 mm, 1.5–2 × sepals, obovate-oblanceolate, with apiculus obsolete. *Stamens c.* 60–80, longest 6–7 mm, 0.85–0.9 × petals, persistent. *Ovary* 3-merous, 3–3.5 × 2–2.5 mm, ovoid, not lobed, acute, 1-locular with slightly intruding placentae; styles 3, (1–)2.5–3 mm long, *c.* 0.7–0.85 × ovary, remaining appressed in fruit. *Capsule* 3.5–6 × 2–4 mm, ellipsoid to ovoid-ellipsoid, obtuse to rounded. *Seeds* blackish brown, 0.6–0.7 mm long, slightly carinate; testa scalariform. 2n = 18 (n = 9) (Hoar & Haertl, 1932 (also 'var. *spongiosum*'); Bostick, 1965).

Marshes, pond margins, wet ditches, bogs (Carolinas); lowland.

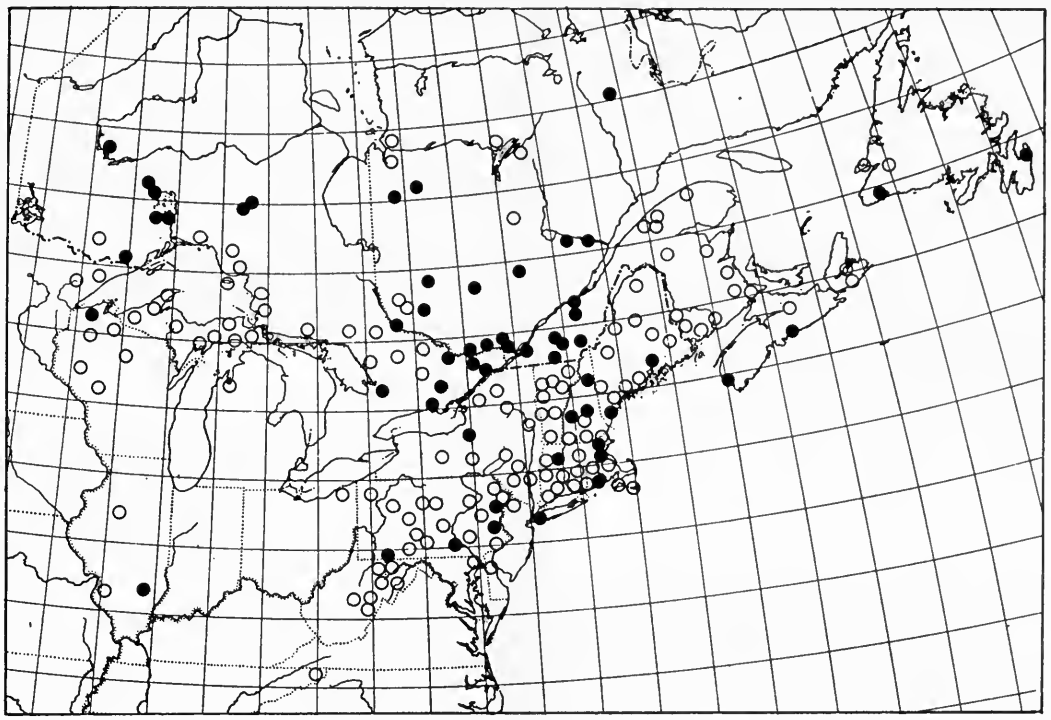
U.S.A., east coastal plain from Massachusetts to Georgia (also inland Ga.), Tennessee, Kentucky?, Missouri and south of L. Michigan.

U.S.A. Connecticut: *New London Co., shore of Shetucket R., 8 August 1899, *Graves* s.n. (GH, NEBC). Delaware: New Castle Co., Wilmington (fl), *Tokall* s.n. (K); Kent Co., Felton, Upland Meadows, July, *Canby* s.n. (K). Georgia: *Dougherty Co., W. of Pretoria, *Thorne* 5709 (GA, IA). Illinois: *Will Co., Braidwood, *Clute* 20 (NY). Indiana: *Jasper Co., 4 km SE of Tefft, *Deam* 45934 (GH, IND). Maryland: *Nantucket Co., Nantucket, Almanac Pond, 14 August 1883 (fl & fr), *Churchill* 573 (MO). Massachusetts: Barnstable Co., Bourne, Flax Pond, 15 September 1901 (fr), *Kennedy, Williams & Fernald* in *Pl. Exs. Gray.* 233 (BM, K, MO, Z). Missouri: *fide* Adams (1959: map 15). New Jersey: no precise locality or date (fl), *Barton* s.n. (BM); *Gloucester Co., Hardingville, *Long* 47122 (PH). New York: *Suffolk Co., Bridgehampton, *Svenson* 5202 (TENN). North Carolina: Northampton Co., near Margarettaville, 28 July 1893 (fl), *Heller* 1155 (GH*, MO*, PH*, Z). Pennsylvania: Bucks Co., Bristol, 30 July 1865 (fl), *Parker* s.n. (K, MO); see also type. Rhode Island: Washington Co., South Kingstown, 13 August 1878 (fl), *Congdon* s.n. (BM). South Carolina: Clarendon Co., Dingle Pond, *c.* 3.2 km S. of US 301, *c.* 3.6 km N. of Marion, 16 September 1967 (fr), *Radford, Bozeman & Leonard* 11457 (BM, H); *Jasper Co., *c.* 2.7 km S. of Tillman, *Ahles* 15675 (NCU). Tennessee: *Coffee Co., S. of Manchester, *Svenson* 8783 (DUKE, MO, PH, WIS). Virginia: *Sussex Co., Stony Creek, *Fernald & Long* 10727 (BM, DUKE, GH, MO, US). West Virginia: Greenbriar Co., White Sulphur Springs, *fide* Millspaugh (1892: 338).

H. adpressum in some respects is intermediate in form between 20. *H. sphaerocarpum* and 22. *H. ellipticum*, and its distribution overlaps those of both species. It is more herbaceous than *H. sphaerocarpum*, with rhizomes and shorter fleshier stems that are sometimes spongy (aerochymatous) at the base, acute leaves and smaller seeds. For differences between *H. adpressum* and *H. ellipticum* see p. 122.

The variation in *H. adpressum* is continuous and so there are no grounds for recognizing the wet-habitat form with fleshy aerenchymatous stems ('f. *spongiosum*') as distinct (see Adams, 1962).

22. **Hypericum ellipticum** Hook., *Fl. bor.-amer.* **1**: 110 (1831); Torrey & Gray, *Fl. N. Amer.* **1**: 164 (1838); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 126 (1878); Coulter in *Bot. Gaz.* **11**: 88 (1886), in A. Gray, *Syn. pl. N. Amer.* **1**: 287 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Fernald, *Gray's Man. Bot.*: 1012 (1950); Gleason, *New Britton & Brown Ill. Fl.* **2**: 539 (1952); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 42 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Utech & Iltis in *Trans. Wis. Acad. Sci. Arts Lett.* **58**: 336, map 4, f. 1 (1970); Scoggan in *Publs Bot. natn. Mus. nat. Sci. Can.* no.7(3): 1096 (1979); Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 35, f. 14 (1978); Gillett & Robson in *Publs Bot. natn. Mus. nat. Sci. Can.* no. 11: 4, tt. 1, 15 ff. 1–2, map 1



Map 13 Sect. 20: 22. *H. ellipticum* ● specimens, ○ records.

(1981); Cooperrider in *Castanea* **54**: 7, f. 1 (1989); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 69 (1995). Type: Canada, 'Canada to Lake Winnipeg', n.d. (fl), *Cleghorn* s.n. (K-lectotype, Adams, 1962); Saskatchewan (lat. 54°), 1819–1822 (fl), *Richardson* s.n. (K!-syntype, BM!); Ontario, Lake Huron, Pentanguishene, 'exactly on the borders of the United States', *Todd* s.n. (K?-syntype). The Todd syntype has not been found at K.
Map 13.

H. sphaerocarpum sensu W.P.C. Barton, *Comp. fl. Philadelph.* **2**: 14 (1818), non Michx. (1803).

Brathydium canadense Spach, *Hist. nat. vég.* Phan. **5**: 446 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836). Type: Canada, *Michaux* s.n. (P-syntype); Canada, *Lady Dalhousie* s.n. (FI-syntype).

Hypericum brathydium Steud., *Nomencl. bot.* 2nd ed. **1**: 786 (1840). Type as for *Brathydium canadense* Spach.

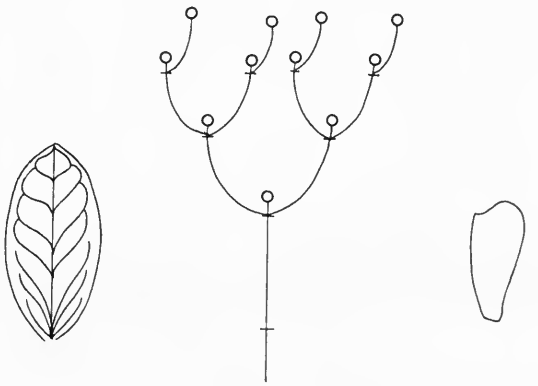
?*H. canadense* var. *oviforme* R. Keller in *Bull. Herb. Boissier* II, **8**: 189 (1908). Type: U.S.A., Pennsylvania (not found).

H. ellipticum forma *submersum* Fassett in *Rhodora* **41**: 376 (1939). Type: Canada, Ontario, Walford, Pipe Lake, Jack Wilson's Resort, 5 August 1936, *Fassett* 19172 (WIS-holotype).

H. ellipticum forma *foliosum* Vict. in *Nat. canad.* **71**: 201 (1944); Scoggan in *Publs Bot. natn. Mus. nat. Sci. Can.* no. 7(3): 1096 (1978). Type: Canada, Quebec, Comté de Portneuf, Rivière du Cap Rouge, 7 September 1941 (st), *Marie-Victorin* et al. 56602 (MT-holotype; F!, GH!, H!, MO, PH, US!-isotypes).

Icones: Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 36, f. 14 (1978); Gillett & Robson in *Publs Bot. natn. Mus. nat. Sci. Can.*, no. 11: 6, t. 1 (1981).

Perennial herb somewhat woody at base, 0.11–0.3(–0.5) m tall, erect from creeping rhizomatous base, unbranched or occasionally branched below. *Stem* red-brown, 4-lined, subancipitous above. *Leaves* sessile, 11–35 × 3–13 mm, rather broadly to narrowly elliptic or oblong-elliptic or oblanceolate, margin plane to subrevolute,



paler but not always glaucous beneath, lower ones eventually deciduous above base, apex rounded, base cuneate to shallowly cordate-amplexicaul; venation: 5–7 pairs of main laterals with secondaries almost equally strong and rather dense tertiary reticulation, only midrib prominent; laminar glands rather dense, obscure in direct light, marginal glands dense. *Inflorescence* (1–)3–15-flowered, regularly dichasial, sometimes with flowering branches from 1–2 nodes below, corymbiform; pedicels 1–2 mm long; bracts 4–6(–9) mm, narrowly oblong to linear-lanceolate. *Flowers* 12–15 mm in diam., buds ellipsoid, rounded. *Sepals* 5(4), 6–7 × 2–3 mm, persistent, somewhat unequal, oblanceolate, obtuse to rounded, margin plane, basal veins 3, branched. *Petals* 5(4), pale? yellow, sometimes tinged red, 6–8 × 3.5–4 mm, obovate to oblanceolate, apiculus obsolete or absent. *Stamens c.* 70–95, longest 4–6 mm, *c.* 0.7 × petals, persistent. *Ovary* 3-merous, (0.8–)1.5–3.5 × 1–1.7 mm, narrowly ovoid, acute, 1-locular with intruding placentae; styles 3, 1.5–3 mm, 0.8–1 × ovary, remaining appressed in fruit. *Capsule* 4–7 × 3.5–5 mm, ellipsoid to globose, obtuse to rounded. *Seeds* reddish brown, 0.6–0.7 mm long, carinate; testa scalariform-reticulate. 2n = 18 (Gillett, 1975, 'c.18'; n = 9, Hoar & Haertl, 1932), 16 (Löve & Löve, 1982).

Stream, lake and pond margins, river flats, wet meadows and swamps; lowland to *c.* 300 m.

Canada (south-western Ontario to southern Newfoundland, extinct further west? – see Richardson's isotype from 'Saskatchewan'), U.S.A. (Minnesota to Maine and south to extreme north-eastern Tennessee, West Virginia, Pennsylvania and northern Delaware).

CANADA. New Brunswick: *Aguance, 19 July 1901 (fl & fr), *Churchill* s.n. (MO); *Bass River, 29 July 1873 (fl), *Fowler* s.n. (MO). Newfoundland: Waterford R. between Waterford Bridge and St. John's, 2 August 1911 (fl), *Fernald & Wiegand* 5843 (BM, GH*, K, NY*, PH*, US*); St. John's, St. George's to Port au Port, Codroy R., South Branch, 2–4 July 1949 (fl), *Toumikoski* 116 (H). Nova Scotia: Halifax Co., Musquodoboit Harbour, Petpeswick, 31 July–3 August 1930 (fr), *Rousseau* 35284 (H, K); Yarmouth Co., Arcadia, Trefrey's Lake, 29 July 1920 (fl), *Fernald & Long* 21855 (K). Ontario: Algoma Distr., Firesand Creek at Hwy 101, 12.8 km E. of Wawa, 7 August 1971, *Garton* 14702 (H); Kenora Distr., English R., 12.4 km W. of Trans-Canada Hwy, near Cloven Lake, 7 August 1961 (fl & fr), *Baldwin* 9378 (H); Thunder Bay Distr., 9.6 km S. of MacDairmid, 0.8 km W. of south end of Orient Bay, 18 June 1960 (fr), *Garton* 8313 (BM). Quebec: Cté de Argenteuil, St-Adolphe d'Howard, 8 August 1966 (fl & fr), *Rolland-Germain* 37417 (BM, H); Chicoutimi Co., vallée de la rivière Ste-Marguerite, 6 August 1964 (fl), *Cayouette* 7044 (H); Tamiskaming Co., Ottawa R., NE bay of Grand Lake Victoria, road to L. Granet, 15 July 1954 (fl), *Baldwin* 5870 (K).

U.S.A. Connecticut: *Hartford Co., Southington, 11 July 1897 (fl), *Bissell* 344? (MO); *New London Co., Franklin Co., 11 July 1906, *Woodward* s.n. (GH). Illinois: Fulton Co., Lewistown, June 1888 (fl), *Repoon* s.n. (BM). Maine: Penobscot Co., Orono, 1 August 1908 (fl), *Fernald* 235 (BM, K, MO*, Z). Maryland: *Garrett Co., vicinity of Mount Lake Park, *Steele* 56 (GH, US). Massachusetts: Essex Co., Florence (Northampton), 24 July 1977 (fr), *Ahles* 84291 (BM, H): Hampshire Co., Andover, July 1882 (fl), *Blake* s.n. (H). Michigan: *Chippewa Co., near Saulte Sainte Marie, 14 August 1910 (fl & fr), *Churchill* s.n. (MO); *Chippewa Co., Sugar I., *McVaugh* 8751 (MICH, NCSC). Minnesota: *Lake Co., along Baptism R., N. shore of L. Superior, *Moore & Huff* 18742 (GH, IND). New Hampshire: Hillsboro Co., Pelham, Long Pond, 14 July 1927 (fl), *Beattie* s.n. (BM, K); Cheshire Co., Surry, Ashuelot R., 9 August 1972 (fr), *Boufford* 7570 (MO*, Z). New Jersey: Madison Co., Lennox, Oneida Lake, 24 July 1901 (fl), *Haberer* 147 (K). New York: *Hamilton Co., Coles Landing, 6 September 1926 (fr), *Wiegand* 16674 (GH, MICH, MO); no precise locality or date (fr), *Gray* s.n. (BM, K). Ohio: *fide* Adams (1959: map 12) and Cooperrider (1989: f. 1). Pennsylvania: Fayette Co., Ohio Pyle, 29 June 1902 (fl), *Shafer* 277 (BM); Forest Co., *c.* 3.2 km S. of Duhring along Spring Creek, 26 August 1955, *Henry* s.n. (CM). Rhode Island: Providence Co., Providence, no date (fl), *Olney* s.n. (K). Tennessee: Johnson Co., Shady Valley Bog (*fide* Gillespie, 1958); *10 km SW of Mountain City, *Shanks & Sharp* 7090 (TENN). Vermont: *Franklin Co., Binghamville, Fairfax, 20 September 1964 (fr), *Seymour & Charette* 22471 (MO); Windham Co., Jamaica, 13 July 1937 (fl), *H. & E. Moldenke* 9914 (BM, *MO). West Virginia: *Upshur Co., 6 July 1895 (fr), *Pollock* s.n. (MO). Wisconsin: Florence Co., Brule R., 1 July 1964 (fl), *Iltis* 22194 (BM); *Sawyer Co., near Hayward, 11 September 1925 (fr), *Palmer* 28628 (MO).

H. ellipticum is related to *H. sphaerocarpum* but differs from it *inter alia* by the shorter herbaceous rhizomatous habit, shorter leaves and smaller seeds. A submerged aquatic form with elongate simple stems and shorter, ovate to orbicular leaves (f. *submersum* Fassett) and one with the axillary branches grown out after fertilization (f. *foliosum* Marie-Victorin) seem scarcely worth recognizing.

Subsect. 4. **Brathydium** (Spach) R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 214 (1893) ['*Eubrathydium*'].

Brathydium Spach, *Hist. nat. vég.* Phan. **5**: 442 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836). Type: see below.

Type: *B. grandiflorum* Spach, nom. illegit. = *Hypericum dolabriforme* Vent. (lectotype, Y. Kimura, 1951).

Shrubs or subshrubs with leaves either articulated at base and deciduous (Sp. 23) or not articulated and persistent or deciduous above base (Spp. 23, 24); inflorescence-branching dichasial, mainly acropetal; sepals 5, very unequal to subequal, persistent; petals 5; stamens 120–200, deciduous (Sp. 23) or persistent (Sp. 24); styles and placentae 3(4), placentation incompletely axile (Sp. 23) or parietal (Sp. 24). Species 23–24.

Kimura (1951) selected his own combination, *Brathydium dolabriforme* (Spach) Y. Kimura, as lectotype; but Spach's name, even though illegitimate, should have been used for the species selected.

23. **Hypericum myrtifolium** Lam., *Encycl.* **4**: 180 (1797); Choisy in DC., *Prodr.* **1**: 547 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 161 (1838); Chapm., *Fl. South. U.S.*: 40 (1865); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 127 (1878); Coulter in *Bot. Gaz.* **11**: 85 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 286 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Small, *Man. s.e. fl.*: 872 (1933); Svenson in *Rhodora* **42**: 19 (1940); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 35 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); R. Long & Lakela, *Fl. Trop. Florida*: 607 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 341, f. 154 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 356, f. 169 (1988). Type: U.S.A., without precise locality, *Herb. B. de Jussieu* (P-LA-holotype; GH-photograph). Map 14.

H. glaucum Michx., *Fl. bor-amer.* **2**: 78 (1803); Pursh, *Fl. Amer. sept.* **2**: 376 (1814); Elliott, *Sketch bot. S. Carolina* **2**: 32 (1821); Choisy, *Prodr. monogr. Hypéric.*: 46 (1821), in DC., *Prodr.* **1**: 547 (1824). Type: U.S.A., Florida, n.d. (fl & fr), *Michaux* s.n. (P-holotype, BM!-microfiche).

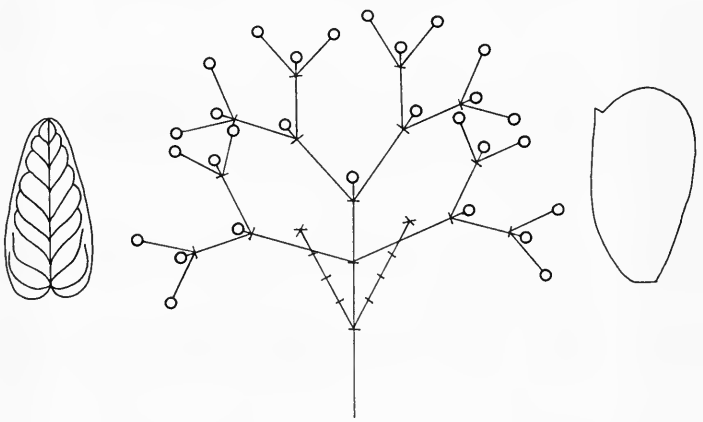
H. rosmarinifolium sensu Choisy, *Prodr. monogr. Hypéric.*: 45 (1821), in DC., *Prodr.* **1**: 547 (1824).

H. sessiliflorum Willd. ex Spreng., *Syst. Veg.* **3**: 346 (1826). Type; U.S.A., 'in America borealis', ? (B-WILLD-holotype, BM!-microfiche).

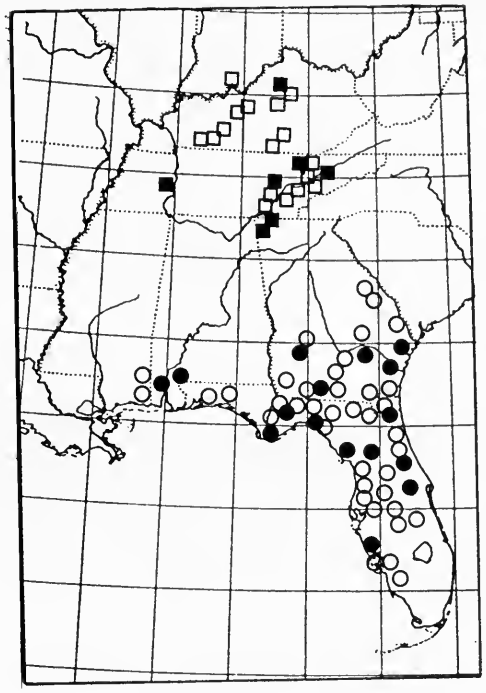
Myriandra glauca (Michx.) Spach, *Hist. nat. vég.* Phan. **5**: 442 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836).

Brathydium myrtifolium (Lam.) K. Koch, *Hort. dendrol.*: 67 (1853).

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 356, f. 169 (1988).



Shrub (or subshrub?), 0.3–1 m tall, mostly 1-stemmed, erect from woody caudex, often unbranched below inflorescence, sometimes with branches in upper half, ascending. *Stems* glaucous green, 4-



Map 14 Sect. 20: 23. *H. myrtifolium* ● specimens, ○ records; 24. *H. dolabriforme* ■ specimens, □ records.

lined and ancipitous when young, soon 4-lined and rounded, becoming reddish brown and 2-lined to terete; cortex exfoliating in strips; bark greyish, becoming corky, thick. *Leaves* sessile, spreading, evergreen, (8–)13–40 × (5–)7–20 mm, oblong-ovate to triangular-lanceolate, margin recurved (especially when dry), paler and usually ± glaucous beneath, sometimes also glaucous above, coriaceous, eventually deciduous at or near semi-articulated base, apex rounded to obtuse or sometimes acute, base subcordate to cordate, ± amplexicaul; venation: 3–4 main laterals, with laxly reticulate secondaries, tertiaries not visible; laminar glands very dense. *Inflorescence* 7–*c.* 30-flowered, regularly dichasial, widely branched, sometimes with 1–3 accessory flowers at apical node, with solitary flowers or 3–7-flowered dichasia or flowering branches up to 3 nodes below, the whole hemispherical to subcorymbiform; pedicels to 3 mm long or absent; bracts foliar, reduced. *Flowers* (15–)20–25 mm in diam.; buds ovoid. *Sepals* 5, 5–8 × 2–4.5 mm, enlarging somewhat in fruit, imbricate, unequal to subequal, ovate to lanceolate, becoming foliaceous, acute, margin recurved; basal veins (3)5, branching and reticulating distally. *Petals* 5, bright yellow, becoming apically recurved, 8–15 × 4.5–6 mm, 1.5–2 × sepals, obovate to oblong-oblanceolate, with apiculus lateral, obtuse. *Stamens c.* 200, longest 5–9 mm, *c.* 0.6 × petals, deciduous. *Ovary* 3(4)-merous, 3–4 × 1.3–3 mm, narrowly pyramidal-ovoid, acute, placentation incompletely axile; styles 3(4), 4–5 mm, 1.2–1.3 × ovary, separating above in fruit. *Capsule* 5–6 × 3–4 mm, pyramidal-ovoid, 3(4)-lobed or 3(4)-gonous. *Seeds* blackish brown, *c.* 1 mm long, narrowly carinate; testa shallowly linear-reticulate. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Moist pine flatwoods, grass/sedge bogs, margins of evanescent ponds and low roadside ditches, on sandy or peaty soil; lowland.

U.S.A. (coastal plain from South Carolina? or Georgia to southeastern Mississippi, including most of peninsular Florida).

U.S.A. Alabama: Baldwin Co., just N. of junction 1–10 by AL 59, 9.6 km S. Stapleton, 8 June 1971 (fl & e. fr), *Kral* 43081 (BM); Mobile Co., Range Line road just N. of AL 163, S. of Mobile, 26 May 1973 (fl), *Boufford & Ahles* 9423 (BM, MO*). Florida: Duval Co., near Jacksonville, June 1894? (fl & fr), *Curtiss* 265 (BKL*, BM, F*, FR, G, GH*, K, MISSA*, NY*, PH*, US*); Lake Co., near Eustis, 1–15 May 1894, *Nash* 708 (G, K); Wakulla Co., US 98 *c.* 20.8 km W. of Newport, 27 June 1959 (fl), *Dress & Read* 7753 (BM). Georgia: Sumter Co., 31 August 1900 (fr), *Harper* 548 (BM, K, MO*); Thomas Co., 4.8 km N. of Pavo, 13 June 1968 (fl), *Adams* 28 (K). Mississippi: *Jackson Co., Belle Fontaine Point, *Diener* 915 (MISSA); *Jackson Co., near Ocean Springs, May 1859 (fl), *Hilgard* s.n. (MO).

Small (1933) recorded *H. myrtifolium* from South Carolina, and there is a specimen in Herb. De Candolle (G-DC) labelled 'Carol. merid., *Fraser*'; but this species is not treated by Radford, Ahles & Bell (1968).

Adams (1962) included *H. myrtifolium* in subsect. *Centrosperma*, and the leaves do have a groove at the base of the midrib beneath. It does not extend along the rest of the lamina base, however, so that the leaves sometimes leave a small zone behind when they fall. In addition, the sepals are persistent after fruit dehiscence, but the stamens are deciduous with the petals and the placentation is incompletely axile. All these characters suggest that *H. myrtifolium* could be intermediate between subsections *Centrosperma* and *Suturosperma*, but the habit, leaf shape, larger sepals and numerous stamens indicate a direct relationship with 1. *H. frondosum*.

24. **Hypericum dolabriforme** Vent., *Descr. pl. nouv.*: 45 & f. (1800); Pursh, *Fl. Amer. sept.*: 378 (1814); Choisy, *Prodr. monogr. Hypéric.*: 45 (1821), in DC., *Prodr.* **1**: 547 (1824); Torrey & Gray, *Fl. N. Amer.* **1**: 162 (1838); Steud., *Nomencl. bot.* 2nd ed. **1**: 787 (1840); S. Watson, *Bibliogr. index N. Amer. bot.* **1**: 126 (1878); Coulter in *Bot. Gaz.* **11**: 87 (1886), in A. Gray. *Syn. fl. N. Amer.* **1**: 287 (1897); Britton & Brown, *Ill. fl. n. states* 2nd ed. **2**: 532, f. 2889 (1913); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Small, *Man. s.e. fl.*: 871 (1933); Svenson in *Rhodora* **42**: 16 (1940); J.P. Gillespie in *Castanea* **24**: 29 (1958); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 40 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973). Type: U.S.A., Kentucky, 'sur les collines très arides de Kentucky', n.d. (fl), *Michaux* (G!-holotype).

Map 14.

H. procumbens Desf. ex Willd., *Sp. pl.* **3**: 1450 (1802). Type: U.S.A., 'Amer. Sept.', ? in Herb. Willd. 14424 (B-WILLD-holotype, microfiche!).

H. procumbens Michx., *Fl. bor.-amer.* **2**: 81 (1803); Pursh, *Fl. Amer. sept.*: 379 (1814); Choisy, *Prodr. monogr. Hypéric.*: 45 (1821), in DC., *Prodr.* **1**: 547 (1824). Type: U.S.A., Kentucky, 'in aridis collibus Kentucky', n.d. (fl), *Michaux* s.n. (P-holotype, BM!-microfiche). Perhaps this is from the same collection as the type of *H. dolabriforme* Vent.

Brathydium grandiflorum Spach, *Hist. nat. vég.* Phan. **5**: 443 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 365 (1836); K. Koch, *Hort. dendrol.*: 66 (1853), nom. illegit. (Art. 63). Type as for *Hypericum dolabriforme* Vent.

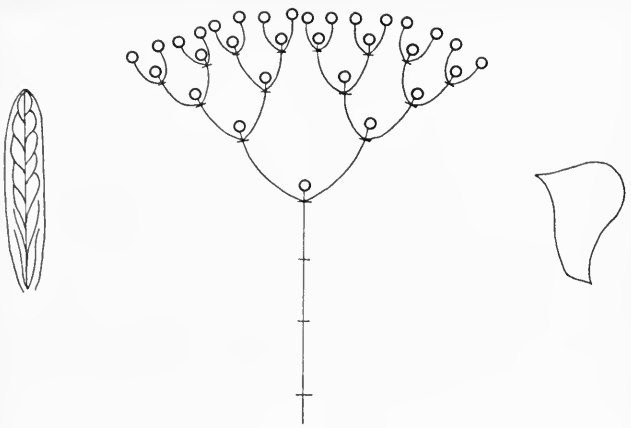
Streptalon dolabriforme (Vent.) Raf., *Fl. Tellur.* **3**: 80 (1837).

Hypericum bissellii B.L. Rob. in *Rhodora* **4**: 136, t. 37 ff. 1–4 (1902). Type: U.S.A., Connecticut, Southington, 30 July 1901 (fl), *Bissell* 4025 (GH!-holotype), see p. 124

Brathydium dolabriforme (Vent.) Y. Kimura in Nakai & Honda, *Nova fl. jap.* **10**: 24 (1951).

Icon: Vent., *Descr. pl. nouv.*: 45 & f. (1800).

Subshrub 0.15–0.5 m tall, decumbent and woody (but not rooting) at base, with short or ± elongate branches at base or throughout stem.



Stem green?, 4-lined and ancipitous above, 2-lined to terete below; cortex exfoliating in strips. *Leaves* sessile, widely spreading: lamina (main stem) 20–35 × 3–5 mm, linear-elliptic or linear-oblong to linear, margin recurved to revolute, pale or slightly glaucous? beneath, subcoriaceous, the lower deciduous slightly above base, apex obtuse to acute, base narrowly cuneate to rounded; venation: only midrib apparent; laminar glands dense. *Inflorescence* (1–)3–*c.* 20-flowered, regularly dichasial, ± widely branched, without accessory flowers, rarely with single flowers from axil below, the whole obconic; pedicels 1.5–2 mm long; bracts foliar, reduced, oblong to lanceolate. *Flowers c.* 15–20 mm in diam.; buds ± ellipsoid, acuminate. *Sepals* 5, 5–8(–15) × 2–3(–8) mm, not enlarging in fruit?, imbricate, very unequal, ovate-lanceolate to lanceolate, ± foliaceous, acuminate, margin distally revolute; basal veins 3, laterals sometimes branched. *Petals* 5, 'golden' yellow, 10–13 × 4–5 mm, *c.* 1.6–2 × sepals, curved-dolabriform, with apiculus conspicuous, termino-lateral, acute. *Stamens* 120–200, longest 5–7 mm, *c.* 0.5 × petals. *Ovary* 3-merous, 2.5–3 × 1.5–2 mm, ovoid-conic, acuminate, placentation parietal; styles 3, 3.5–4 mm, 1.35–1.4 × ovary, sometimes separating above in fruit. *Capsule* 4–7(–9) × 3–3.5(–4) mm, ovoid-conic, rostrate, 3-gonous above. *Seeds* reddish, 1.5–1.8 mm long, carinate; testa reticulate-scalariform. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Limestone outcrops, cedar glades and dry rocky stream-beds; lowland to *c.* 500 m in Georgia.

U.S.A. (from extreme southern Indiana and north-central Kentucky southward through eastern Tennessee to north-western Georgia; probably introduced into Connecticut).

U.S.A. Connecticut: see *H. bissellii* above, probably introduced. Georgia: ? Co., east base of Pigeon Mts, 300 m, 3 August 1900 (fl & fr), *Harper* 359 (BM, K); *Catoosa Co., 16 km W. of Ringgold, *Cronquist* 5614 (GA, GH, IND, MO, NY, PH, SMU, UCA, US); Walker Co., Chickamauga, 11 July 1899 (fl), *Herb. Biltmore* 6474a (JE, Z). Indiana: *Crawford Co., vicinity of Wyandotte Cave, 13 July 1899, *Blatchley* s.n. (IND). Kentucky: *Nelson Co., 19.2 km S. of Bardstown, *McFarland* 50 (DUKE, GH, IND, MO, NY, PH, TENN, WIS); *Warren/Simpson Co. line, on US 31W, 30 June 1969 (fl & fr), *Conrad* 236 (MO); *Wayne Co., Monticello, *Smith & Hodgdon* 4013 (F, GH, NY, US); ? Co., Estival, 1831 (fl), *Rafinesque* s.n. (G). Tennessee: Meigs Co., near Decatur, 13 July 1934 (fl), *Sharp & Underwood* 2293 (BM); Knox Co., near Mascot, 30 June 1958 (fl & fr), *Adams* 61 (K, MO*).

H. dolabriforme is a relict species of which the affinities are not immediately apparent. Adams (1962: 41) claimed it to be most closely related to 20. *H. sphaerocarpum*, which is similarly semi-woody with linear leaves, axillary leaf-clusters, an almost wholly terminal dichasial inflorescence and somewhat unequal sepals. The capsules of *H. dolabriforme*, however, are much bigger, the inflorescence branches more widely spreading, the sepals much more unequal and recurved-acuminate (rarely subrecurved and obtuse to acute), the petals curved-dolabriform, the stamens more numerous (120–200, not 70–95) and the seeds much larger. All these characters, except the linear leaves and large seeds, can however be derived easily from those of 23. *H. myrtifolium*; and the leaves, though narrow, are of similar texture and colour. The larger seeds need not be an insuperable obstacle to a relationship with *H. myrtifolium*, which seems to be directly related to 1. *H. frondosum* like the 4-petalled '*Ascyrum*' species.

I agree with Adams (1962: 41) that *H. bissellii* is a synonym of *H. dolabriforme*. Robinson's illustration could be of *H. sphaerocarpum*, but the type specimen clearly belongs to *H. dolabriforme*. Considering that this species is otherwise confined to west or south of the Appalachians, the record from a street in a Connecticut town is likely to have resulted from an introduction.

Subsect. 5. **Ascyrum** (L.) N. Robson, **stat. nov.**

Ascyrum L., *Sp. pl.*: 787 (1753), *Gen. pl.* 5th ed.: 342 (1754) excl. *A. villosum* L. et *A. crux-andreae* L. pro parte quoad syn.; Engl. in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 208 (1893), op. cit., 2nd ed. **21**: 174 (1925) pro parte, excl. *A. filicaule* Dyer. Type: *A. hypericoides* L. (= *Hypericum hypericoides* (L.) Cr.) (lectotype – Britton & Brown, 1913: 528).

Hypericoides Adans., *Fam. Pl.* **2**: 443, 616 (1763); Lam., *Tabl. encycl.*: t. 644 (1796). Type: *Hypericum hypericoides* (L.) Cr. (= *Hypericoides perforata* Poir.) (lectotype – N. Robson, 1977*a*).

Ascyrum a. *Ascyrum* (L.) Endl., *Gen. Pl.*: 1032 (1840), autonym status ignot.

Type: *H. hypericoides* (L.) Cr. (see above).

Shrubs or wiry shrublets with leaves articulated at base (Spp. 25, 26) or not, deciduous sooner or later at or above base; inflorescence-branching dichasial and/or pseudo-dichotomous, basipetal and/or acropetal; sepals 4, markedly unequal, persistent; petals 4; stamens 30–100, persistent; styles and placentae 2–4, placentation parietal. Species 25–29.

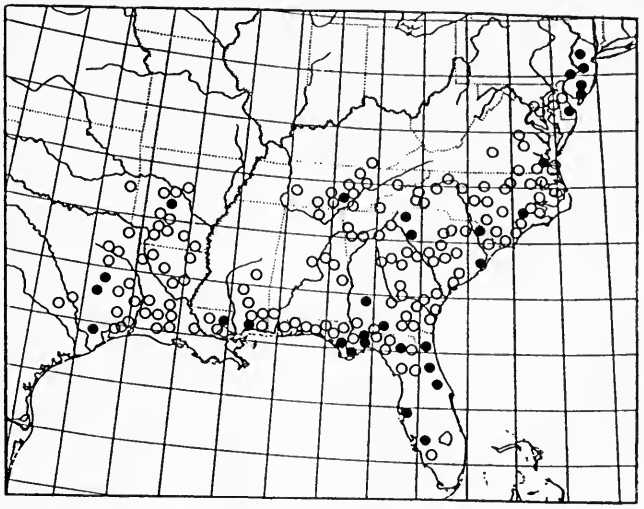
25. **Hypericum crux-andreae** (L.) Cr., *Inst. rei herb.* **2**: 520 (1766); N. Robson in *Taxon* **29**: 272 (1980); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.*, Dicots: 340 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 371 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 350, f. 165 (1988); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 69 (1995). Type: U.S.A., Virginia, *Clayton* 230 (LINN 944/1-lectotype – N. Robson, 1980).

Fig. 18A, Map 15.

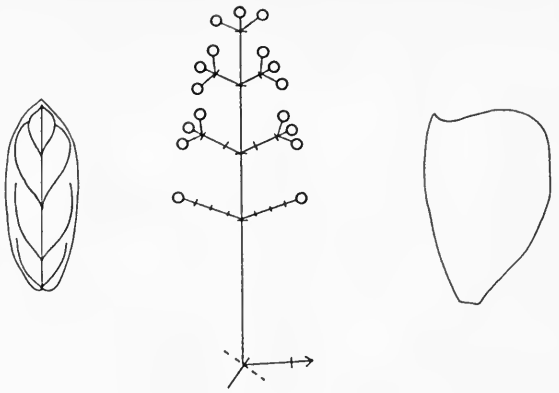
Ascyrum crux-andreae L., *Sp. pl.*: 787 (1753) excl. syn., *Sp. pl.* 2nd ed.: 1107 (1763) excl. syn. Plukenet.; Lam., *Encycl.* **1**: 285 (1783) pro parte, excl. syn. Plukenet. et Raii.

Hypericum tetrapetalum [var.] β sensu Lam., *Encycl.* **4**: 153 (1797), *fide* microfiche P-LA 73/7.

Ascyrum stans Michx. ex Willd., *Sp. pl.* **3**: 1473 (1802); Michx., *Fl. bor.-amer.* **2**: 77 (1803); Vent., *Jard. Malmaison* **2**: t. 90 (1805) pro parte, excl. syn. *Hypericum tetrapetalum* Lam.; Choisy, *Prodr. monogr. Hypéric.*: 61 (1821) pro parte, excl. [var.] β, in DC., *Prodr.* **1**: 555 (1824) pro parte excl. syn. *H. tetrapetalum* Lam.; Spach, *Hist. nat. vég.* Phan. **5**: 457 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 368 (1836); Torrey & Gray, *Fl. N. Amer.* **1**: 157 (1838); A. Gray, *Gen. Amer. bor.* **1**: t. 91 (1848); Chapm., *Fl. South. U.S.*: 39 (1865); Coulter in *Bot. Gaz.* **11**: 81 (1886), in A. Gray, *Syn. Fl. N.*



Map 15 Sect. 20: 25. *H. crux-andreae* ● specimens, O records.



Amer. **1**: 283 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 174 (1925); Small, *Man. s.e. fl.*: 868 (1933); Fernald, *Gray's Man. Bot.*: 1007 (1950); W.P. Adams in *Rhodora* **59**: 88, map 4 (1957); J.P. Gillespie in *Castanea* **24**: 27 (1958); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 732 (1960); Correll & Johnston, *Man. vasc. pls Texas*: 1060 (1970); K.G. & M.L. Brown, *Woody pls Maryland*: 233 (1972). Type: U.S.A., 'Hab. in Carolina', *Michaux* (P-holotype).

A. hypericoides sensu W.T. Aiton, *Hort. Kew.* 2nd ed.: 430 (1812); Elliott, *Sketch bot. S. Carolina* **2**: 22 (1821).

A. amplexicaule sensu Pursh, *Fl. Amer. sept.* **2**: 374 (1814) pro parte, quoad syn. *A. stans* Willd.

A. grandiflorum Raf., *Fl. ludov*: 87 (1817). Type: U.S.A., Louisiana (no specimen found).

Hypericoides crux-andreae (L.) Poir., *Tab. Encycl.* **3**: 201, t. 644 f. 1 (1823).

Ascyrum stans [var.] β *obovatum* Chapm. ex Torrey & Gray, *Fl. N. Amer.* **1**: 157 (1838); Chapm., *Fl. South. U.S.*: 39 (1865). Type: U.S.A., Florida, 'Middle Florida', *Chapman* s.n. (NY-holotype).

A. simplex Zeyh. ex Turcz. in *Bull. Soc. Nat. Moscou* **31**(1): 389 (1858). Type: U.S.A., Pennsylvania, Bethlehem, n.d. (fl.), *Zeyher* s.n. (KW-holotype; BM!-photograph).

A. cruciatum St-Lag. in *Annls Soc. bot. Lyons* **7**: 69 (1880), nom. illegit. (Art. 63). Type as for *A. crux-andreae* L.

A. cuneifolium Chapm., *Fl. South. U.S.* 2nd ed., Suppl. **2**: 680 (1892), op. cit., 3rd ed.: 56 (1897); Small, *Fl. s.e. U.S.*: 785 (1903), *Man. s.e. fl.*: 868 (1933); Merrill in *Castanea* **13**: 66 (1948). Type: Florida, 1835, *Chapman* (NY!-holotype).

Hypericum stans (Michx.) Adams & Robson in *Rhodora* **63**: 15 (1961); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 44 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Radford, Ahles & Bell, *Man. vasc. pls Carolinas*: 711 (1968); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); R. Long & Lakela, *Fl. trop. Florida*: 607 (1971).

H. peltatum sensu T. & M. Eisner & Aneshansley in *Proc natn. Acad Sci. U.S.A.* **70**: 1002 (1973), nomen.

Icones: Vent., *Jard. Malmaison* **2**: t. 90 (1805); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 350, f. 165 (1988).

Shrub 0.1–1.0(–1.35) m tall, erect to suberect or rarely decumbent and rooting at base, unbranched or rarely sparsely branched below inflorescence (at least until fruiting), branches suberect. *Stems* becoming red-brown, 2–4-lined and ancipitous when young, soon narrowly 2-winged; cortex exfoliating in thin strips or flakes; bark thin, reddish brown, not corky. *Leaves* sessile, ascending to spreading, (12–)18–30(–36) × (6–)8–12(–16) mm, oblong to elliptic or rarely obovate to oblanceolate or triangular-ovate, margin plane to subrecurved, paler beneath, sometimes slightly glaucous on both sides, coriaceous, eventually deciduous at basal articulation, apex rounded to obtuse, base rounded to truncate or rarely slightly cordate-amplexicaul; venation: up to 3 pairs of laterals sometimes visible; laminar glands dense. *Inflorescence* 1–3(–7)-flowered from 1–4 nodes, sometimes with flowering branches from up to 4 nodes below, the whole ± narrowly cylindric to narrowly pyramidal or occasionally with one pair of pseudo-dichotomous branches; pedicels 3–5 mm long; bracts foliar; bracteoles triangular-lanceolate. *Flowers* 20–30 mm in diam.; buds compressed-subglobose. *Sepals* 4, markedly unequal, not? enlarging in fruit; outer 9–17(–20) × 9–14(–18) mm, broadly ovate to circular, apiculate to obtuse or rounded, base cordate, basal veins (3)5–7, midrib often branched; inner 7–14 × 2–3(–4) mm, narrowly elliptic to lanceolate, acute to subacute, basal veins 3(–5), midrib sometimes branched. *Petals* 4, bright yellow, 11–18 × 6–10(–12) mm, *c.* 05–1.2 × outer sepals, obovate, with apiculus lateral, acute. *Stamens* 80–100, longest 7–8 mm, 0.45–0.65 × petals. *Ovary* 3(4)-merous, (3.5–)4–5 × 1.5–2.5 mm, narrowly ellipsoid-ovoid, acute, placentation parietal; styles 3(4), (1–)1.5–2.5 mm, 0.35–0.5 × ovary, divergent. *Capsule* 7–9(–10) × 5–6.5 mm, narrowly ellipsoid-ovoid, obtuse (or apiculate *fide* Small), scarcely lobed. *Seeds* blackish brown, 0.8 mm long, ecarinate; testa shallowly scalariform. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Moist to dry pine savannahs and flatwoods, meadows, bogs, marshes, ditches, shores of ponds and lakes, on sandy soil; lowland.

U.S.A. (eastern Texas and south-eastern Oklahoma to Florida and northwest to New York (Long Island), New Jersey and eastern Pennsylvania).

U.S.A. Alabama: *Barbour Co., by L. Eufaula, 8 km S. of Eufaula, 11 September 1968 (fr), *Kral* 33219 (MO); Talladega Co.?, 'supra Talladega ad fl. Coosa', Sept. 1843 (fr), *Rugel* s.n. (BM); *Mobile Co., *Graves* 697 (MO, US). Arkansas: *Clark Co., Arkadelphia, 60 m, 1 October 1938 (fr), *Demaree* 18422 (MO); Hot Springs Co., Malvern, 4 September 1915 (fl), *Palmer* 8463 (K, MO*); no precise locality or date, *Leavenworth* s.n (K). Delaware: *New Castle Co., *Tatnall* 1959 (GH, PENN); Sussex Co., Ellendale, August 1867 (fl), *Canby* s.n. (H). Florida: Franklin Co., W. of Fla 379, *c.* 19 km S. of Liberty-Franklin county line, 9 November 1963 (fr), *Ward & Ford* 3645 (BM, FLAS*); Hillsborough Co., NE Tampa, Industrial Park, W. of 46th St., intersected by Linebaugh Ave., 13 November 1963 (fr), *Lakela* 26666 (BM, USF*). Georgia: Bulloch Co., SE of Statesboro, 4.9 km N. of Georgia 46 on co. road 204, then right for 1.3 km, *c.* 65 m, 16 September 1982 (fl & fr), *Boufford, Bartholomew & Spongberg* 23137 (A*, BM, MO*); Thomas Co., *c.* 5 km NW of Pavo, 10 August 1958 (fl), *Adams* 159 (K). Kentucky:

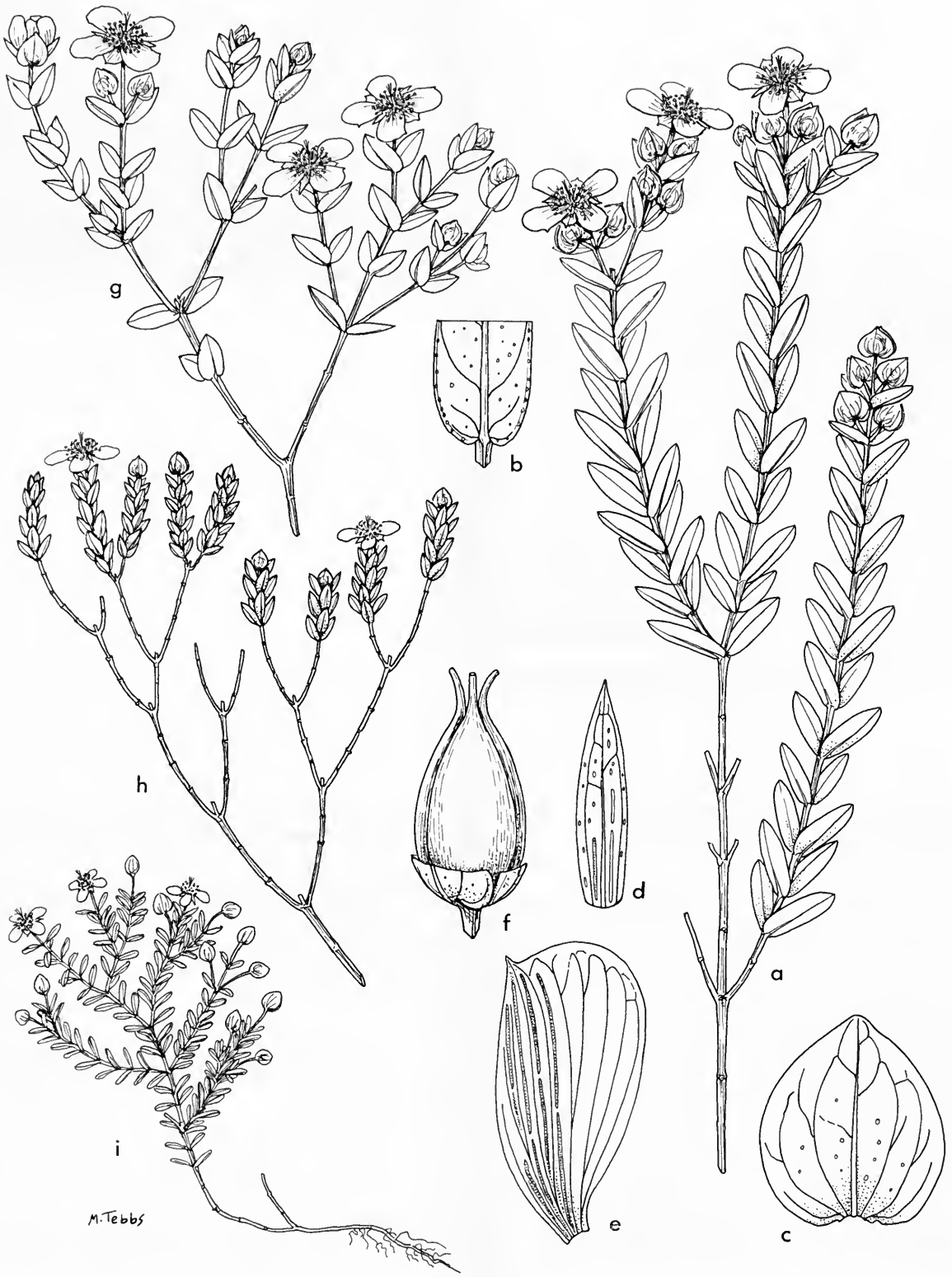


Fig. 18 A. *H. crux-andreae*: (a) habit; (b) leaf (part); (c) outer sepal; (d) inner sepal; (e) petal; (f) capsule. B. *H. tetrapetalum*: (g) habit. C. *H. edisonianum*: (h) habit. D. *H. suffruticosum*: habit (a, g-i × ½; b × 2: c-f × 3). A. *Boufford* 21405. B. *Skean* 1600. C. *Judd* 2517. D. *Curtiss* 246.

*McCreary Co., Bauer Road, 24 July 1941 (fl), *McFarland & James* 48 (DUKE, IND, MO, PENN, TENN, US, WVA). Louisiana: *Beauregard Par., *Correll & Correll* 9681 (DUKE, F, GH); *Rapides Par., 1896 (fl), *Dodson* s.n. (MO); St. Tammany Par., Covington, June-August 1832 (fl), *Drummond* s.n. (BM, K). Maryland: *Prince George Co., Hyattsville, 14 August 1910 (fl), *Dowell* 6464 (GH, MO, NY); *Worcester Co., 0.8 km N. of Ocean City, 11 September 1936 (st), *Norton* s.n. (M). Mississippi: Harrison Co., Gulfport, 5 September 1900 (fl), *Tracy* 87 (BM); *Ocean Springs, 22 August 1891 (fl), *Seymour* 91822 (MO). New Jersey: Atlantic City, 30 August 1882 (fl), *Parker* s.n. (K); Burlington Co., *c.* 9.6 km W. of Chatsworth, 20 August 1948 (fl), *Lawrence & Dress* 528 (BM). New York: see Adams (1957). North Carolina: *Macon Co., Highlands, 31 July 1975 (fr), *Boufford & Wood* 17755 (MO); Onslow Co., 8.8 km S. of N.C.41 on County road 1003, S. of Comfort and NE of Richmond City, 22 August 1979 (fl & fr), *Boufford* 21405 (BM, CM*). Oklahoma: *Le Flore Co., *Palmer* 20595 (GH). Pennsylvania: *Bucks Co., 28 August 1864, *Diffenbaugh* s.n. (GH); Philadelphia Co., near Philadelphia, August (fr), *Griffith* 136 (BM). South Carolina: Marlboro Co. 2.4 km E. of Wallace, 10 August 1956 (fl), *Radford* 15625a (K); Oconee Co., Whitewater R. 3.2 km NW of Jocasee, 2 September 1956 (fl), *Radford* 17892 (H). Tennessee: *Coffee Co., *Svenson* 4246 (GH, IND, PH); *Franklin Co., 10 September 1898 (fl), *Eggert* s.n. (MO); Grundy Co., 6.4 km N. of Palmer by Savage Gulf off Collins School Road, 2 September 1971 (fr), *Kral* 43739 (BM). Texas: *Houston Co., Latexo, 22 September 1917 (fl), *Palmer* 12819 (MO); *Smith Co., along Sabine R., near Gumwood, 27 September 1926 (fr), *Palmer* 31727 (MO). Virginia: Norfolk Co., prope Norfolk, August 1840 (fl), *Rugel* 202 (BM); *Princess Anne Co., near Virginia Beach, *Heller* 1268 (F, GH, NY, PENN, PH, US).

H. crux-andreae, with its tetramerous perianth whorls and very unequal sepals, is directly related to 1. *H. frondosum*, in which the sepals are very unequal and both perianth whorls are quite often tetramerous. It differs from that species in having (as well as the constantly tetramerous perianth) sessile leaves, a lower habit and smaller flowers at more stem nodes.

Adams (1957) showed that Chapman's *Ascyrum cuneifolium* (*A. stans* var. *obovatum* Chapm. ex Torrey & Gray) cannot be separated from typical *H. crux-andreae* (=*A. stans*). The low, several-stemmed form with cuneate leaves, longer-pedunculate flowers and shorter sepals varies in the direction of 28. *H. suffruticosum*, but there is no overlap in variation in these taxa.

26. **Hypericum tetrapetalum** Lam., *Encycl.* **4**: 153 (1797); Adams & Robson in *Rhodora* **63**: 15 (1961); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 45 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); R. Long & Lakela, *Fl. trop. Florida*: 606 (1971); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 340 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 348, f. 164 (1988). Type: U.S.A., Florida, 'Hab. in Florida', *?* (P-LA-holotype, GH- photograph).

Fig. 18B, Map 12.

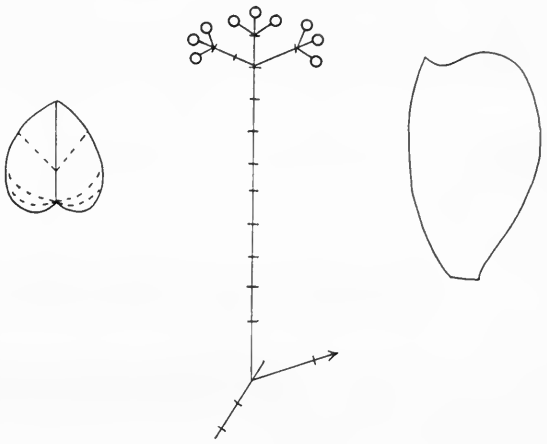
Ascyrum amplexicaule Michx., *Fl. bor.-amer.* **2**: 77 (1803); Pursh, *Fl. Amer. sept.* **2**: 374 (1814); Elliott, *Sketch bot. S. Carolina* **2**: 23 (1821); Choisy in DC., *Prodr.* **1**: 555 (1824); Spach, *Hist. nat. vég.* Phan. **5**: 457 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 368 (1836); Torrey & Gray, *Fl. N. Amer.* **1**: 156 (1838); Chapm., *Fl. South. U.S.*: 39 (1865); Coulter in *Bot. Gaz.* **11**: 81 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 283 (1897). Type: U.S.A., Florida, without precise locality, *Michaux* s.n. (P-holotype:, BM!-microfiche).

A. stans [var.] β sensu Choisy, *Prodr. monogr. Hypéric.*: 61 (1821). Specimen in Herb. De Candolle (G-DC), not located.

A. cubense Griseb., *Cat. Pl. Cub.*: 40 (1886); Sauvalle in *An. Acad. Cienc. méd. fis. nat. Habana* **5**: 203 (1868), *Fl. cub.*: 8 (1869). Type: Cuba, Pinar del Río, 'juxta pineta pr. Piñales, 1860–1864', *Wright* 2128 (GOET-holotype; BM!, GH!, K!, MO!, NY!, US!-isotypes).

A. tetrapetalum (Lam.) Vail in Small, *Fl. s.e. U.S.*: 785 (1903), *Man. s.e. fl.*: 868 (1933); Leon & Alain, *Fl. Cuba* **3**: 315 (1953); W.P. Adams in *Rhodora* **59**: 93 (1957).

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 348, f. 164 (1988).



Shrub or perennial herb woody at base, 0.2–1 m tall, erect, often unbranched, branches divaricate or ascending. *Stems* green, (2)4-lined and ancipitous when young, becoming 2-lined to terete; cortex exfoliating in strips or flakes; bark thin, reddish brown, not corky. *Leaves* sessile, (5–)8–35 × 4–15 mm, oblong-ovate or ovate to triangular-ovate, margin subrecurved, paler beneath, not glaucous, coriaceous, eventually deciduous at basal articulation, apex apiculate or obtuse to rounded, base cordate-amplexicaul; venation: only one pair of basal laterals visible; laminar glands dense, large; inframarginal glands dense. *Inflorescence* 1(3)-flowered with branching pseudo-dichotomous, occasionally with short lateral branches from up to 3 nodes below; pedicels 3–12 mm long; bracts foliar. *Flowers* 20–30 mm or more in diam.; buds compressed-subglobose. *Sepals* 4, markedly unequal, not? enlarging in fruit; outer 7–13(–15) × 5.5–9(–10) mm, broadly ovate, foliaceous, subapiculate to obtuse, base cordate, basal veins 3(5), unbranched; inner 7–15 × 2–*c.* 3 mm, narrowly lanceolate, acute, basal veins 1–3. *Petals* 4, bright yellow, 10–15 (or larger?) × 7–10 mm, 1.2–1.3 × sepals, obovate-oblong, with apiculus lateral, acute to incurved, acuminate. *Stamens c.* 100, longest *c.* 4.5–6.5, *c.* 0.45 × petals. *Ovary* 3-merous, 3–3.5 × 1.6–2 mm, pyramidal-ovoid to ellipsoid-ovoid, acute, placentation parietal; styles 3, 3–3.5 mm, 1–1.2 × ovary, divergent distally. *Capsule c.* 5–6 × 3.5–4, broadly ellipsoid-ovoid to subglobose, 3-lobed. *Seeds* blackish brown, *c.* 0.7 mm long, ecarinate; testa shallowly scalariform. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Moist low pinelands and roadside ditches, on sandy soil; lowland.

U.S.A. (Florida and adjacent Georgia and Alabama), Cuba (Pinar del Río).

U.S.A. Alabama: Baldwin Co., E. side of US 90–98, E. from Mobile by causeway, 7 June 1971 (fl), *Kral* 43061 (BM). Florida: Duval Co., 4.3 km S. of Nassau Co., line on US route 1 and 23, NW of Jacksonville, 30 May 1973 (fr), *Boufford* 9265 (BM, MO*); Lake Co., Eustis, 16–30 June 1895, *Nash* 1977 (DAO*, K, MO*, NCU*, PH*); Sarasota Co., Fla 780, 25.1 km E. of Sarasota, 20 June 1974 (fl), *Baltzell* 6501 (BM). Georgia: *Glynn Co., Brunswick, 5 April 1939 (fl & fr), *Koelz* 13466 (MO); *Irwin Co., 6.4 km N. of Ocilla, *Wilbur* 3074 (FSU, NCSC, SMU); *McIntosh Co., Sapelo Island, *Duncan* 17970 (GA).

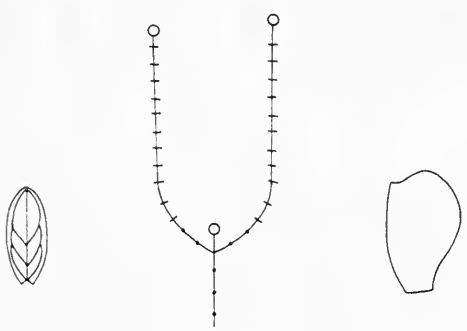
CUBA. Pinar del Río: Viñales, La Vega, February 1867 (fl), *Wright* 2128 (BM, GH, MO, NY, S, US).

H. tetrapetalum is a derivative of 25. *H. crux-andreae*, differing from it in the ovate to triangular-ovate leaves, which are strongly cordate-amplexicaul and sometimes grade in form into that of the outer sepals, although they are usually somewhat larger. The terminal pseudo-dichotomous inflorescence is also nearly always diagnostic, but the Alabama specimen cited is intermediate in this respect. These two species overlap in distribution in southern Georgia and northern Florida but do not otherwise intergrade morphologically.

27. **Hypericum edisonianum** (Small) W.P. Adams & N. Robson in *Rhodora* **53**: 15 (1961); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 44 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1873); D.B. Ward, *Rare & endangered biota of Florida* **5**. Plants: 94 (1980); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 340 (1981). Type: U.S.A., Florida, Highlands Co., '21 miles [33.6 km] east of Arcadia', *Hand* 118 (NY-holotype).

Fig. 18C, Map 16.

Ascyrum edisonianum Small, *Man. s.e. fl.*: 868 (1933); W.P. Adams in *Rhodora* **59**: 91 (1957).



Shrub 0.3–1.5 m tall, erect, often unbranched below, much branched pseudo-dichotomously above, forming spreading flat-topped crown; horizontal roots bearing adventitious shoots form thickets. *Stems* red-brown, 4–6-lined and ancipitous when young, soon 2-lined; cortex exfoliating in strips; bark thin, reddish brown to grey, not corky. *Leaves* sessile, appressed or ± spreading, 15–26 × 5–8(–11)mm, elliptic, margin subrecurved to subincrassate, paler beneath, markedly glaucous above only, coriaceous, soon deciduous at base leaving prominent gland-like auricles, apex obtuse to acute, base cuneate to subrounded; venation: up to 4 pairs of laterals sometimes visible: laminar glands dense. *Inflorescence* 1-flowered with repeated pseudo-dichotomous branching; pedicels 3–5 mm; bracts foliar; bracteoles lanceolate. *Flowers* 15–20 mm in diam.; buds compressed-subglobose. *Sepals* 4, markedly unequal, not? enlarging in fruit; outer (8–)9–13(–17) × (5–)6–8(–9) mm, broadly ovate, acute to subacuminate, base cordate, basal veins 5–7, midrib not or obscurely branched; inner *c.* 5–6 × 0.6–1.2 mm, linear-lanceolate, acuminate, basal veins 5, midrib unbranched. *Petals* 4, bright? yellow, (10–)12–18 × (5–)6–11 mm, *c.* 1.2 × sepals, obovate with apiculus lateral, acute. *Stamens c.* 70–80, longest 6–7 mm, *c.* 0.5 × petals. *Ovary* 3–4-merous, 3.5–4 × *c.* 1.5 mm, narrowly triangular-ovoid, acute, placentation parietal?; styles 3–4, 2–3 mm long, 0.6–0.75 × ovary, wholly appressed. *Capsule* 5–8 × (3?–)4 mm, triangular-ovoid, acute, 3–4-lobed. *Seeds* brown to yellow-brown, *c.* 0.8 mm long, ecarinate; testa 'reticulate' (Godfrey & Wooten).

In sandy soil of low prairies, in marshy areas in pine flatwoods and at pond margins; lowland.

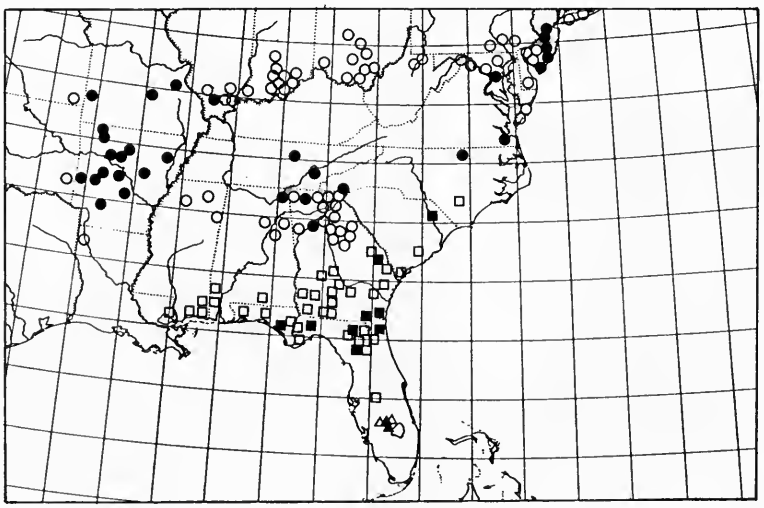
U.S.A. (central peninsular Florida – Highlands, Glades and De Soto Counties).

U.S.A. Florida: Glades Co., Fla. 17, 9.6 km NW of Palmdale, 7 May 1975 (fl & e. fr), *Baltzell* 7285 (BM, FLAS*); Highlands Co., 8 km NE of Old Venus in Old State Road 8 (Childs to Venus), 30 September 1979 (fl), *Judd* 2517 (BM, FLAS*).

H. edisonianum is a derivative of 25. *H. crux-andreae*, from which it can be distinguished by the smaller, thicker, obtuse to acute leaves, the pseudo-dichotomous branching and the paired persistent gland-like auricles at the base of each leaf.

Ward (1980) suggested that *H. edisonianum* had been isolated on the Lake Wales Ridge of central peninsular Florida during Pleistocene flooding, when much of Florida was beneath sea level.

28. **Hypericum suffruticosum** W.P. Adams & N. Robson in *Rhodora* **63**: 15 (1961), sphalm. '*suffructicosum*'; W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 49 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Radford, Ahles & Bell, *Man. vasc. pls*



Map 16 Sect. 20: 27. *H. edisonianum* ▲ specimens, Δ records; 28. *H. suffruticosum* ■ specimens, □ records; 29. *H. hypericoides*: b. subsp. *multicaule* ● specimens, ○ records, also in Massachusetts, Nantucket I.

Carolinas: 710 (1968); R.C. Clarke in *Ann. Mo. bot. Gdn* **58**: 210 (1971); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 353, f. 167 (1988). Type as for *Ascyrum pumilum* Michaux.

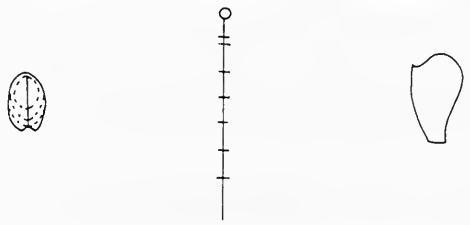
Fig. 18D, Map 16.

Ascyrum pumilum Michx., *Fl. bor-amer.* **2**: 77 (1803); Pursh, *Fl. Amer. sept.* **2**: 373 (1814); Elliott, *Sketch bot. S. Carolina* **2**: 21 (1821); Choisy, *Prodr. monogr. Hypéric.*: 60 (1821), in DC., *Prodr.* **1**: 555 (1824); Spach, *Hist. nat. vég.* Phan. **5**: 463 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 369 (1836); Torrey & Gray, *Fl. N. Amer.* **1**: 156 (1838); Chapm., *Fl. South. U.S.*: 39 (1865); Coulter in *Bot. Gaz.* **11**: 79 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 283 (1897); Small, *Man. s.e. fl.*: 867 (1933); W.P. Adams in *Rhodora* **59**: 77 (1957); non *Hypericum pumillum* Sessé & Mociño (1894). Type: U.S.A., Georgia, without precise locality, *Michaux* s.n. (P-holotype, BM!-microfiche).

A. pauciflorum Nutt., *Gen. N. Amer. pls* **2**: 15 (1818); Choisy, *Prodr. monogr. Hypéric.*: 60 (1821), in DC., *Prodr.* **1**: 555 (1824); non *Hypericum pauciflorum* Kunth (1822). Type: U.S.A., Georgia, 'e sylvestris Georgiae', *Nuttall* s.n. (PH-holotype; BM!).

A. nummularifolium Banks [in sched.] ex Steud., *Nomencl. bot.* 2nd ed.: 77 (1840), nomen.

Icon: Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 353, f. 167 (1988).



Dwarf shrub 0.05–0.15(–0.2) m tall, erect, few- to many-stemmed and cushion-like or decumbent and ± matted, branched from near base and sparingly pseudo-dichotomously, branches suberect or ± spreading. *Stems* becoming red-brown, 4-lined and ancipitous when young, soon narrowly 2-winged; cortex exfoliating in thin strips or flakes; bark thin, reddish brown, not corky. *Leaves* sessile to subsessile, ± spreading, (3–)4–8(–10) × (1–)2–3 mm, narrowly obovate or oblanceolate to elliptic or oblong-linear, margin plane to subrecurved, paler beneath, sometimes slightly glaucous. subcoriaceous, eventually deciduous above base, apex obtuse, base rounded to cuneate; venation: only midrib visible; laminar glands dense; inframarginal glands dense. *Inflorescence* 1-flowered, often with a pair of pseudo-dichotomous branches; peduncle 0.5 mm long; pedicel (5–)7–10(–12) mm long, mostly recurved to reflexed at maturity; bracts foliar; bracteoles linear-subulate. *Flowers c.* 10–15 mm in diam.; buds compressed-subglobose. *Sepals* 4 and markedly unequal or 2, enlarging somewhat in fruit; outer (4–)5–8 × (4–)4.5–6(–8) mm, broadly ovate to broadly elliptic, obtuse to rounded, base truncate to angustate, near-basal veins 3, all branched; inner (when present) minute. *Petals* 4, pale yellow, (4–)5–8 × (4–)5–6(–8) mm, often unequal, narrowly obovate, with apiculus terminal, obtuse, fugaceous. *Stamens c.* 30, longest 2.5–4 mm, 0.4–0.6 × petals. *Ovary* 2-merous, 2–2.5 × 0.6–1.3 mm, narrowly compressed, cylindric-ellipsoid, obtuse, placentation parietal; styles 2, 1.2–1.5 mm, 0.6 × ovary, appressed or divergent above. *Capsule* 3–5 × 2–3 mm, cylindric-ellipsoid, rounded, compressed. *Seeds c.* 1 mm long, scarcely carinate; testa finely reticulate. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Dry sandy open pinelands of the coastal plain: lowland.

U.S.A. (southern North Carolina to eastern Louisiana, excluding most of peninsular Florida).

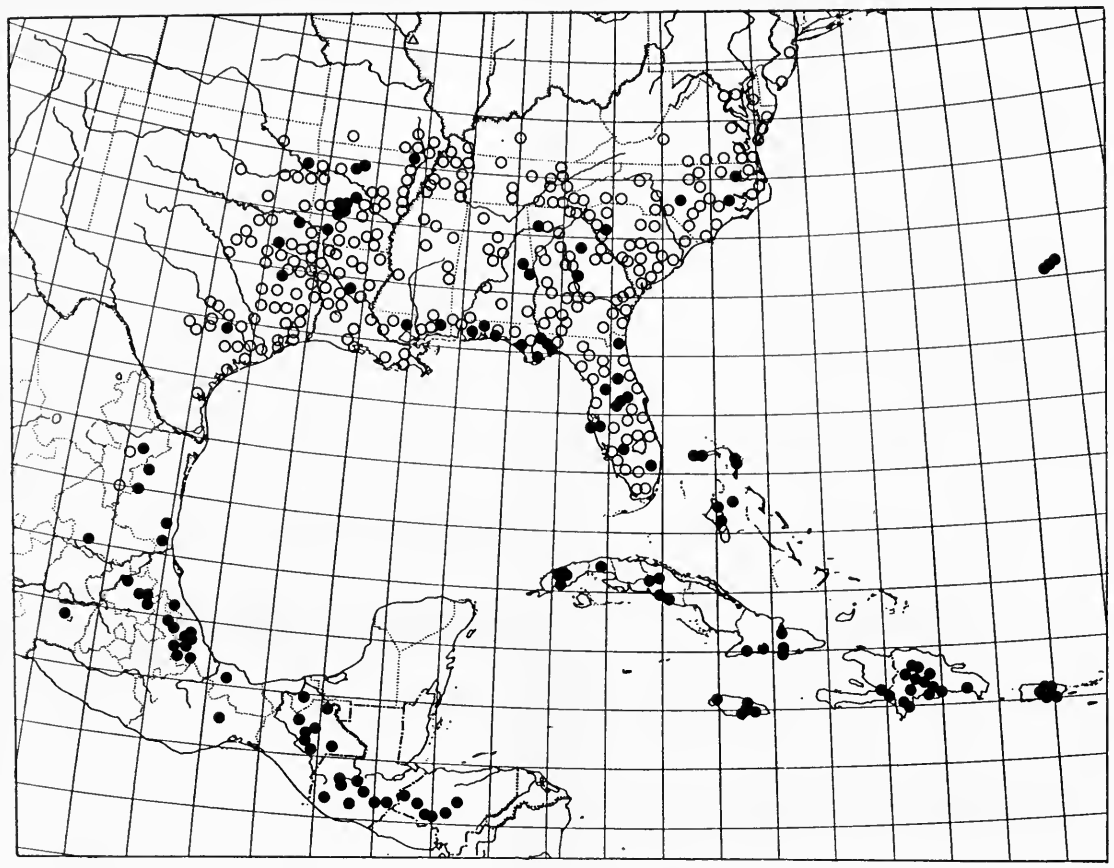
U.S.A. Alabama: *Covington Co., *Hardin & Duncan* 14974 (GA); *Washington Co., Fruitdale, 5 May 1904 (fr), ? (MO). Florida: Bay Co., 3.2 km E. of Lynn Haven, 20 May 1961 (fl & fr), *Adams* 774 (K); Columbia Co., Lake City, 11–19 July 1895 (fr), *Nash* 2211 (GH*, K, MICH*, MO*, NY*, US*); Duval Co., near Jacksonville, April (fl), *Curtiss* 246 (BM, F*, FLAS*, GH*, K, MISSA*, MO*, NY*, PH*, US*). Georgia: Bulloch Co., S. of Portal, *c.* 65 m, 6 May 1982 (fl & fr), *Boufford* et al. 22814 (A*, BM, MO*); Camden Co., S. of Kingsland, 12 May 1930 (fl & fr), *Moldenke* 1180 (K, MO*). Louisiana: *St. Tammany Par., *Bougère* 2006 (LSU). Mississippi: *Harrison Co., Biloxi, *Tracy* 4489 (F, MICH, MO, NY, OS, US); *Jackson Co., May 1930, *Donald* s.n. (MISSA). North Carolina: *Bladen Co., *Wood* 8499 (GH). South Carolina: *Colleton Co., 17.6 km NW of Walterboro, *Adams* 84 (FSU); Jasper Co., US 601, *c.* 2.2 km N. of junction of Co. Route 27–169, 22 June 1968 (fl), *Leonard & Radford* 1678 (BM, H).

Adams (1957) related *H. suffruticosum* to 29. *H. hypericoides* (using *Ascyrum* nomenclature); but the link seems clearly to be with 25. *H. crux-andreae* through the reduced form of that species that has been named *Ascyrum cuneifolium* Chapman, which occurs in extreme north-eastern Florida and Alabama. *H. suffruticosum* is thus derived from a different part of *H. crux-andreae* from that which gave rise to 24. *H. edisonianum* (q.v.).

29. **Hypericum hypericoides** (L.) Cr., *Inst. rei herb.* **2**: 520 (1776); Adams & Robson in *Rhodora* **63**: 15 (1961); W.P. Adams in *Contr. Gray Herb. Harv.* no. 189: 46 (1962), in *Rhodora* **64**: 237 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Radford, Ahles & Bell, *Man. vasc. pls Carolinas*: 710 (1968); R.C. Clark in *Ann. Mo. bot. Gdn* **58**: 209 (1971); R. Long & Lakela, *Fl. trop. Florida*: 606 (1971); N. Robson in *Taxon* **29**: 272 (1980); Godfrey & Wooten, *Aquatic & wetland pls s.e. U.S.* Dicots: 341 (1981); Clewell, *Guide vasc. pls Florida Panhandle*: 372 (1985); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 354, f. 168 (1988); N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 68 (1993), in *Eur. Gdn Fl.* **4**: 70, ff. 10.7, 10.8, 10.13 (1995). Type as for *Ascyrum hypericoides*.

Maps 16, 17.

Ascyrum hypericoides L., *Sp. pl.*: 788 (1753) excl. syn. *Hort. Cliff.* et Plukenet., 2nd ed.: 1108 (1763) excl. syn. Plukenet.; Marshall, *Arbust. amer.*: 14 (1785) ['*hypericodes*']; Willd., *Sp. pl.* **3**: 1473 (1802); W.T. Aiton, *Hort. kew.* 2nd ed. **3**: 430 (1812) pro parte; Choisy, *Prodr. monogr. Hypéric.*: 61 (1821), in DC., *Prodr.* **1**: 555 (1824); Griseb. *Fl. Br. W. I.*: 112 (1860); Coulter in *Bot. Gaz.* **11**: 80 (1886), in A. Gray, *Syn. fl. N. Amer.* **1**: 283 (1897); Small, *Fl. s.e. U.S.*: 785 (1903), *Man. s.e. fl.*: 867 (1933); Urban, *Symbol. Antill.* **4**: 411 (1910); Engl. in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 174 (1925) pro parte, excl. syn. *A. crux-andreae* L.; Fawcett & Rendle, *Fl. Jamaica* **5**: 202, f. 79 (1926); Leon & Alain, *Fl. Cuba* **3**: 315 (1953); W.P. Adams in *Rhodora* **59**: 79 (1957), in op. cit. **64**: 237 (1962); Correll & Johnston, *Man. vasc. pls Texas*: 1060 (1970); R.G. & M.L. Brown, *Woody pls Maryland*: 233 (1972); Strausbaugh & Core, *Fl. W. Virginia* 2nd ed.: 638 (1980). Type: Hispaniola, *Hypericoides frutescens erecta, flore luteo* Plumier, *Nov. Pl. Amer. Gen.*: t. 7 (1703) (lectotype – Robson, 1980: 272). Fawcett & Rendle (1926: 203) indicated the type as Patrick Browne's specimen from Jamaica (LINN 944.2) named *Hypericum angustifolium* in Solander's hand with correction to *Ascyrum*, the correct specific epithet having been added by Sir J.E. Smith; and Adams (1957: 83) designated this specimen as a neotype, it having been added to the Linnaean herbarium only in 1758, after the publication of *Species plantarum* (1753). As I have explained, however (Robson, 1980), there is no need for the



Map 17 Sect. 20: 29. *H. hypericoides*: a. subsp. *hypericoides* ● specimens, ○ records, Δ extinct? (Illinois).

selection of a neotype, as Plumier's illustration is an appropriate lectotype.

A. perforata Lam., *Encycl.* **1**: 285 (1783), nom. illegit. (Art. 63.2) ['*Ascyre perforée*'].

Hypericoides perforata Poir., *Tab. encycl.* **3**: 201, t. 644 f. 2 (1823).

Shrub to wiry shrublet (0.05–)0.1–1.2(–1.5) m tall, erect or decumbent to prostrate, unbranched or with ± sparse lateral branches or branched from base and ± diffuse, sometimes mat-forming, lateral branches erect or ± spreading, sometimes also branched pseudo-dichotomously. *Stems* red-brown, 2-winged, the subsidiary lines only visible when very young; cortex exfoliating in thin strips or flakes; bark thin, reddish brown, not corky. *Leaves* sessile, spreading to rarely ascending, (5–)7–25(–34) × (1–)1.5–6(–8.5) mm, oblanceolate to narrowly oblong or linear, margin subrecurved, slightly paler beneath, not glaucous, subcoriaceous, eventually deciduous just above base, apex rounded to obtuse, base rounded or usually cuneate with paired basal glandiform auricles; venation: 1–2 pairs of basal or near-basal veins sometimes visible, tertiary reticulation obscure or not visible; laminal glands dense. *Inflorescence* 1–3-flowered from 1–4 nodes, sometimes with flowering branches from up to 10 nodes below, the whole narrowly cylindric to narrowly pyramidal, or sometimes with a pair of inflorescences of the above type developing from one pseudo-dichotomous branching, or branching wholly pseudo-dichotomous; peduncle + pedicel 3–6 mm long, pedicel up to *c.* 1 mm (i.e. bracteoles touching or very near sepals); bracts foliar; bracteoles triangular-subulate. *Flowers* 10–15(–20) mm in diam.; buds compressed-globose to compressed-ellipsoid. *Sepals* 4, markedly unequal, enlarging somewhat in fruit; outer 5–12.5 × (2–)4–12(–13) mm, ovate-suborbicular to narrowly elliptic, obtuse or subapiculate to acute, margin plane, base shallowly cordate to broadly cuneate, basal veins 3, outer pair branched; inner minute or obsolete, up to *c.* 4 × 2 mm, lanceolate, acute, basal veins 3, outer pair branched. *Petals* 4, bright to pale yellow, (6–)8–11(–12) × 2–4(–5) mm, 1(–1.5) × outer sepals, obovate to narrowly oblong-elliptic, apiculus subapical, obtuse (very short) or absent. *Stamens c.* 40–50, longest 3–5 mm long, *c.* 0.5 × petals. *Ovary* 2-merous, 3–4 × 0.8–1.5 mm, narrowly ovoid, acute, placentation parietal; styles 2, 0.5–1 mm long, becoming outcurved. *Capsule* 5–9 × 2–4 mm, narrowly compressed-ovoid to narrowly compressed-cylindric-ellipsoid, acute. *Seeds* purple-brown, 0.6–0.8 mm long, ecarinate; testa finely linear-reticulate to linear-foveolate. 2n = 18 (n = 9, Adams in Robson & Adams, 1968).

Dry open sandy habitats, especially pinewoods, roadsides and hillsides, or moist shady woods and thickets, bogs and lake margins; lowland to 840 m (U.S.A., Arkansas), 1800 m (Guatemala), 1650 m (Jamaica) or 2900 m (Dominican Republic).

U.S.A. (south-east of line: eastern Texas, eastern Oklahoma to southern Missouri and eastward to New York (Long Island) and Massachusetts), eastern Mexico, Guatemala, Honduras Republic, Cuba, Hispaniola, Porto Rico, Jamaica, Bahamas, Bermuda. Introduced into the Azores.

H. hypericoides is clearly related to 25. *H. crux-andreae* but can be constantly distinguished by the 2-merous gynoecium, narrower leaves, smaller flowers and more richly branched stems. It is very variable in habit and in leaf and sepal shape and size. The form with erect stems unbranched at the base, narrowly oblong leaves and cylindric inflorescence (mainly in the S. Carolina/Georgia area) is

morphologically nearest to *H. crux-andreae*. From this form, two lines of evolution have both resulted in plants with diffuse to prostrate stems, one in the northern range of the species in the U.S.A. (subsp. *multicaule*) and the other at high altitudes in the Dominican Republic (subsp. *prostratum*). The former has been treated as a species (*H. stragulum* Adams & Robson) and a variety (*H. hypericoides* var. *multicaule* (Michx. ex Willd.) Fosberg), but subspecies would seem to be the appropriate rank for this taxon.

29a. **Hypericum hypericoides** subsp. **hypericoides**
Map 17.

Hypericoides frutescens, erecta, flore luteo Plum., *Nov. pl. amer.*: 51 (1703).

Ascyrum foliis oblongis, fruticosum, ramis erectis Burm., *Pl. amer.*: 146, t. 152 f. 1 (1758).

Ascyrum crux-andreae [var.] β *angustifolium* Nutt., *Gen. Amer. Pls* **2**: 16 (1818); Choisy, *Prodr. monogr. Hypéric.*: 61 (1821), in DC., *Prodr.* **1**: 555 (1824) pro parte, excl. syn. *A. multicaule*; Torrey & Gray, *Fl. N. Amer.* **1**: 156 (1838) ['*angustifolia*']. Type: U.S.A., 'hab. in Carolina', *Nuttall* s.n. (PH?-holotype).

A. linifolium Spach, *Hist. nat. vég.* Phan. **5**: 459 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 368 (1836); Britton & Millsp., *Bahama fl.*: 280 (1920). Type: U.S.A., Louisiana, Covington, 1832 (fl), *Drummond* s.n. (P-holotype; BM!).

A. michauxii Spach, *Hist. nat. vég.* Phan. **5**: 460 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 368 (1836). Type: U.S.A., '*Ascyrum multicaule* var.' *Michaux* (P-holotype). In his second paper, Spach cites his synonym as '*A.. amplexicaule* var. Michx.! herb.'. I have not seen a specimen.

A. oblongifolium Spach, *Hist. nat. vég.* Phan. **5**: 461 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 369 (1836). Type as for *A. crux-andreae* var. *angustifolium* Nutt.

A. montanum Raf., *Fl. Tellur.*: 116 (1838). Type not located.

A. plumieri Bertol. in *Memorie Accad. Sci. Bologna* **4**: 77 (1853), *Misc. bot.* **12**: 19, t. 3 f. 3f, g ['*plumierii*']. Type: U.S.A., Alabama, *Gates* s.n. (BO-holotype, BM!-microfiche).

A. crux-andreae sensu Chapm., *Fl. South. U.S.*: 38 (1865); Griseb., *Cat. Pl. Cub.*: 40 (1866); Sauvalle, *Fl. cub.*: 8 (1868).

A. macrosepalum S. Brown in *Jl N.Y. bot. Gdn* **13**: 192 (1912); Britton, *Fl. Bermuda*: 245 & t. (1918). Type; Bermuda, Paget Marsh, 29 November–14 December 1912 (fr), *Brown & Britton* 1136 (NY!-holotype; F!, GH!, MO!, PH, US!-isotypes).

A. hypericoides var. *typicum* Fernald in *Rhodora* **38**: 432 (1936). Type as for *A. hypericoides* L.

A. hypericoides var. *oblongifolium* (Spach) Fernald in *Rhodora* **38**: 433 (1936), in *Gray's Man. Bot.*: 1008 (1950); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 754 (1960).

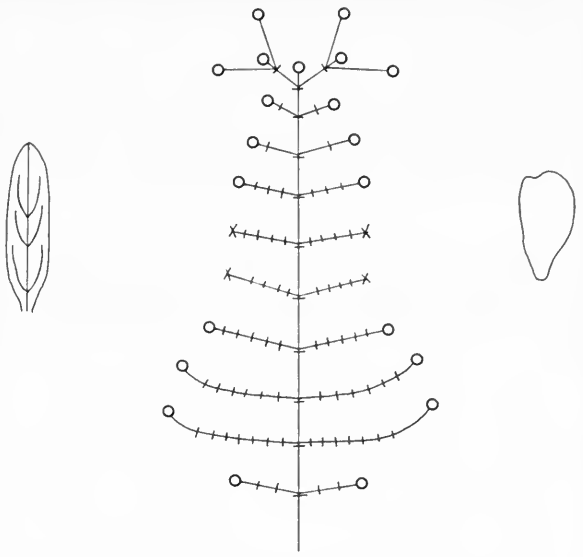
Hypericum hypericoides (L.) Cr. var. *hypericoides*, R. Long & Lakela, *Fl. trop. Florida*: 606 (1971).

Icones: Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 18, f. 5 (1978); Godfrey, *Trees, shrubs & woody vines n. Florida, etc.*: 354, f. 168 (1988).

Plant erect, with main stem usually unbranched from base, 0.3–1.5 m tall, freely branched well above ground level. *Leaves* oblong to linear (broadest at the middle), 7–25 × 1–8.5 mm. *Inflorescence*-branching dichasial/lateral to pseudo-dichotomous.

Habitats of the species, but absent in the the Dominican Republic from above 2000 m.

Distribution of the species except for absence north of the line: Virginia, Kentucky, southern Missouri, Oklahoma.



U.S.A. Alabama: Dallas Co., 8 km E. of Selma on Dallas road, *c.* 43 m, 23 September 1965 (fr), *Demaree* 52975 (BM); Lee Co., Auburn, October 1896 (fr), *Earle & Baker* s.n. (Z). Arkansas: Montgomery Co., Mt Ida, S. fork of Ouachita R., 210 m, 1 October 1962 (fr), *Demaree* 46620 (BM); Pope Co., Nogo, 11 September 1932 (fr), *Merrill* 27 (NY). Florida: Hendry Co., Labelle, 19 April 1930 (fl), *Moldenke* 11019 (BM, K, MO*); Wakulla Co., 1.6 km N. of St Mark's, 17 October 1958 (fr), *Godfrey* 57865 (BM, FSU*). Georgia: Clarke Co., Barnet Shoales, 12 April 1925 (st), *Maguire* s.n. (BM, GA*); Ogelthorpe Co., Lexington, 201 m, 25 September 1965 (fr), *Demaree* 53008 (BM). Illinois: *Hancock Co., Augusta, July 1842. *Mead* s.n. (MO) (*fide* Mohlenbrock & Evans, 1972: 145), extinct? Kentucky: *Hickman Co., Bayou du Chien, 23 August 1923 (fr), *McFarland* 213 (GH, MO); *Marion Co., 1.6–2.4 km SE of New Market, 8 July 1939 (fl), *Wharton* 4686 (MO). Louisiana: *Caddo Par., *Shinners* 21177 (GA, SMU); St. Tammany Par., Covington, 1832 (fl), *Drummond* s.n. (BM, K). Maryland: Dorchester Co., Baltimore, Blackwater National Wildlife Refuge, 20 August 1972 (e. fr), *Windler, Kuser & Shastny* 4130 (H); *Worcester Co., *Fernald, Long & Fogg* 5573 (GH, PENN). Mississippi: Harrison Co., Biloxi, 8 July 1900 (fl), *Tracy* 6897 (BM); *Jackson Co., Ocean Springs, 14 September 1891 (fr), *Seymour* 91914 (DUKE, F, GH, MO, NCU, SMU, TEX). Missouri: *Butler Co., 19 October 1905 (fr), *Bush* 3762 (GH, MO, US); *Dunklin Co., Campbell, 2 September 1910 (fr), *Bush* 6236 (MO). New Jersey: *Cape May Co., S. Seaville to S. Dennisville, 8 August 1937 (fr), *Langheim* s.n. (MO). North Carolina: Chowan Co., 9.6 km E. of St John's Indian Trail Road, 14 October 1958 (e. fr), *Ahles* 51011 (H); Orange Co., W. of Chapel Hill, *c.* 2.25 km from NC54 on Orange Grove road, 31 August 1973 (fr), *Boufford* 11764 (A*, BM). Oklahoma: *Atoka Co., *Hopkins* 2850 (OKL); Le Flore Co., Page, W. end of Rich Mtn, Ouachita National Forest, 26 October 1966 (fr), *Demaree* 53254 (BM); *Wagoner Co., near Wagoner, 3 September 1913 (fr), *Stevens* 2602 (MO). South Carolina: *Berkeley Co., 16 km NE of Monck's Corners, 13 September 1939 (fr), *Godfrey & Tryon* 8217 (DUKE, F, GH, MO, NY, PENN, TENN, US); Chesterfield Co., 9.6 km E. of Patrick, 11 August 1956 (fr), *Radford* 15807 (K). Tennessee: *Coffee Co., *Norris & Sharp* 16269 (TENN); *Franklin Co., Hungland, 6 August 1939 (fr), *Svenson* 10404 (MO); *Shelby Co., near Memphis, 18 May 1920 (st), *Palmer* 17532 (MO). Texas: *Anderson Co., Wilcox near Balestinge, 1 August 1943 (fr), *Barkley* 13598 (MO); Brazoria Co., Columbia, 24 March 1914 (fl), *Palmer* 5006 (K); Wood Co., 6.4 km E. of Mineola, 10 August 1967 (fl), *Mears & Kukkonen* 2407 (H). Virginia: *Mathews Co., 'Fort Nonsense', S. of Soles, 1 September 1925 (fl), *Wherry & Pennell* 12611 (MO); Princess Anne Co., Creed's, 9 September 1935 (fr), *Fernald, Long & Fogg* 4941 (K).

MEXICO. Chiapas: 54.6 km SE of Comitan, Los Lagos, 1500 m, 18 January 1952 (fl), *Carlson* 2250 (MEXU, MICH); mun. Tenejapa, Colonia San Antonio, 2115 m, 8 August 1964 (fr), *Breedlove* 7050 (BM, F, MICH). Hidalgo: Km. 284 on highway NE of Jacala, Puerto de la Zorre, *c.* 1500 m, 8 July 1948 (fl), *Moore & Wood* 3785 (A, MICH); Distr. Zacualtipan, mun.

Zacualtipan, mountains above Tzincuatlan, 1900 m, 7 November 1946 (fl & fr), *Moore* 1880 (GH). Michoacan: Morelia, Laguna, 2000 m, *Arsène* s.n. (JE). Nuevo Leon: Mun. Montemorelos, La Trinidad, 19 August 1939 (fl), *Muller* 2851 (GH, MICH). Oaxaca: Cordillera, 1200–1650 m, 1840 (fr), *Galeotti* 920 (K, W). Puebla: Huauchinango, near Catalina, 1650 m, 2 October 1944 (fl & fr), *Sharp* 441139 (GH); Zacapoaxtla, 13 September 1941 (fl & fr), *Miranda* 3290 (MEXU). San Luis Potosí: 20 km SE of Zargoza, Mesita de Gallos, 2000 m, 8 July 1955 (fr), *Rzedowski* 6090 (MEXU, MICH, US). Tamaulipas: mun. Aldama, *c.* 40 km NNW of Aldama, 23 July 1957 (fl), *Dressler* 1976 (GH, MEXU, MICH, MO); vicin. Marmolejo, 12 August 1930 (fl), *Bartlett* 10908 (MICH). Vera Cruz: near Jalapa, 1200 m, 21 June 1901 (fl), *Pringle* 8515 (BM, C, F, GH, K, MEXU, MO, P, US, W, Z); mun. Chiconquiaco, Guacamaya, 1900 m, 11 May 1973 (fl), *Ventura* 8275 (MICH).

GUATEMALA. Alta Verapaz: Coban, 1290 m, May 1886 (fr), *von Turckheim* 88 (GH, JE, K, US, Z); near San Cristobal Verapaz, 1300 m, 6 January 1973 (fl), *Williams, Molina & Williams* 42219a (F). Baja Verapaz: Sierra de las Minas, near La Union, 1800 m, 18 January 1974 (fl), *Williams* et al. 43556 (BM). El Quiche: between Chalul and Cotzal, 1800 m, 6 February 1946 (fl), *Sharp* 4679 (F). Huehuetenango: Trinidad, 13 August 1896 (fl), *Seler* 3083 (GH, US). Jalapa: between Güisiltepeque and Potrero Carillo, 1800 m, 11 December 1939 (fr), *Steyermark* 33086 (F). Zacapa: Sierra de las Minas, between Río Hondo and Finca Alejandria, 1000–1500 m, 11 October 1939 (fl), *Steyermark* 20726 (F).

HONDURAS REPUBLIC. Copán: between San Isidro and San Cristobal, *c.* 16 km S. of Copán Ruinas, 26 August 1975 (fr), *A. & A. Molina* 30697 (MO). Intibucá: vicin. La Esperanza and Intibucá, 1500–1600 m, 31 January–12 February 1950 (fl), *Standley* 25344 (F, US); Kms 9–11 between La Esperanza and Marcala, 1600 m, 5 April 1956 (fl), *A. & A. Molina* 24290 (F, MO). La Paz: 20 km from Marcala, La Chorrera, 1200 m, 24 March 1969 (fl), *A. & A. Molina* 24410 (F).

BERMUDA. Pembroke Marshes, 11 August 1913 (fl), *Collins* 232 (F, GH, K, US, W); North Shore, 31 August–20 September 1905 (e. fr), *Brown & Britton* 10 (A, F, K, US).

BAHAMAS. Andros: 1.6 km W. of main road, just N. of Love Hill, 7 June 1975 (fl), *Hill* 3136 (NY). Grand Bahama: Eight Mile Rocks, 5–13 February 1905 (o. fr), *Britton & Millspaugh* 2380 (F, K, US). Great Abaco: by end of Norman Castle road, near Winding Bay Pond, 7 July 1969 (fr), *Proctor* 30665 (BM). New Providence: S. of Delaporte Caves on Blake Road, 9 July 1960 (fl), *Webster, Samuel & Williams* 10373 (F, GH, US).

CUBA. Pinar del Río: Arroya del Sumidero, 7 & 9 August 1912 (fl), *Shafer & Leon* 13616 (BM, F, MO, US); Sabanalamar, El Sábalo, April 1950 (fl), *Bro. Alain* 1323 (G, H, US). Las Villas: Trinidad Mts, San Blas to Buenos Aires, Gavinas, 18 September 1941 (fl), *Gonzales* 154 (BM); near Manacas, 11 July 1936 (fl), *Smith & Hodgdon* 3096 (US). Oriente: Sierra Maestra supra Daiguiri, *c.* 1000 m, 29 October 1916 (fl), *Ekman* III 8172 (F, MICH, US): Santiago, Gran Piedra, April 1949 (fl), *Bro. Clemente* 6496 (GH, US).

HAITI. Massif de la Selle, Morne des Commissaires, near Marc Établi, 1500 m, 7 December 1941 (fl & fr), *Holdridge* 878 (BM, MICH, MO, NY, US); vicin. of Mission, Fondo Varettes, *c.* 1000 m, 17 April – 4 May 1920 (fl & fr), *Leonard* 3828 (GH, NY, US).

DOMINICAN REPUBLIC. Barahona: between Pedernales and Aceitial, 8–12 August 1946 (fl), *R. & E. Howard* 8160 (BM, GH, NY, US); Sierra de Bearuco, near Canote, 15 January 1970 (fl), *Terborgh* 134 (A). La Vega: prope Jarabacoa, 600 m, June 1912 (fr), *Fuertes* 1618 (GH, NY, US, W, Z); 5 km W. of La Culata (de Constanza), 1470–1500 m, February 1982 (fl & fr), *Zanoni* et al. 19250 (NY). Monte Cristi: Sabaneta, Lagunas de Cenobí, 15 August 1929 (fl), *Valeur* 16 (US). Santiago Rodríguez: San José de las Matas, 180–210 m, 22 April 1931 (fl), *Valeur* 754 (F, MICH, MO, NY, US); Cabirmar, arroya Los Guanos, 8–4 km al SE de Los Ramones en el camino hacia Manaclas, 630 m, 16 July 1985 *Mejía, Pimentel & García* 1466 (BM, JBSD*).

PUERTO RICO. Prope Utuado in montibus ad Cazuco, 9 March 1887 (fl), *Sintenis* 6377 (BM, F, GH, K, MO, US, W, Z); Laguna Tortuguero, 17 January 1968 (fl & fr), *Howard & Nevling* 16952 (A).

JAMAICA. Portland: *c.* 100–200 m W. of Silver Hill Gap, 1050 m, 10 July 1967 (fl & fr), *R. & S. Weaver* 948 (GH). St Andrews: near Bellevue, *c.* 1200 m, 17 November 1957 (fl), *Yuncker* 17427 (BM, F, MICH). St Thomas: Blue Mts, between Portland Gap and Blue Mountain Peak, 1650–2240 m, 18 August 1954 (fl), *Webster & Wilson* 5458 (A, BM, MICH).

AZORES (introduced?). Faial: Coastal Branco, 8 October 1962 (fl), *Gonçalves* 740 (BM).

Subsp. *hypericoides* varies in leaf-width, the narrow-leaved form (*Ascyrum linifolium*) being found in the southern States from Louisiana to Florida as well as in the Bahamas and Bermuda (*A. macrosepalum*). Britton (1918) suggested that it had been carried to Bermuda by wind or birds from Florida and had there speciated, but the Bermudan plants do not differ from other narrow-leaved forms. The occurrence of this subspecies in the Azores could also be the result of long-distance transport, but it could equally have been introduced by man.

29b. **Hypericum hypericoides** subsp. **multicaule** (Michx. ex Willd.) N. Robson in *Taxon* **29**: 273 (1980); in Cullen et al., *Eur. Gdn Fl.* **4**: 70 (1995). Type as for *Ascyrum multicaule* Michx. ex Willd.
Map 16.

Ascyrum multicaule Michx. ex Willd., *Sp. pl.* **3**: 1472 (1802); Michx., *Fl. bor.-amer.* **2**: 77 (1803). Type: 'Hab. in Virginia, Carolina', *Michaux* s.n. (extreme r.h. specimen) (P-holotype, BM!-microfiche, GH-photograph).

A. crux-andreae [var.] β sensu Choisy, *Prodr. monogr. Hypéric.*: 61 (1821) pro parte, quoad syn. *Ascyrum multicaule*.

A. helianthemifolium Spach, *Hist. nat. vég.* Phan. **5**: 460 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 368 (1836). Type: U.S.A., Louisiana, *Michaux*? (P-holotype).

A. spathulatum Spach, *Hist. nat. vég.* Phan. **5**: 462 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 369 (1836). Type: U.S.A., without precise locality or collector (P-holotype, BM!- microfiche).

A. crux-andreae sensu Coulter in *Bot. Gaz.* **11**: 80 (1886).

A. hypericoides var. *multicaule* (Michx. ex Willd.) Fernald in *Rhodora* **38**: 433 (1936), in *Gray's Man. Bot.*: 1008 (1950); W.P. Adams in *Rhodora* **59**: 87 (1957); R.A. Vines, *Trees, shrubs & woody vines of S.W.*: 754 (1960); Correll & Johnston, *Man. vasc. pls Texas*: 1080 (1970); Cooperrider in *Castanea* **54**: 7, f. 1 (1989).

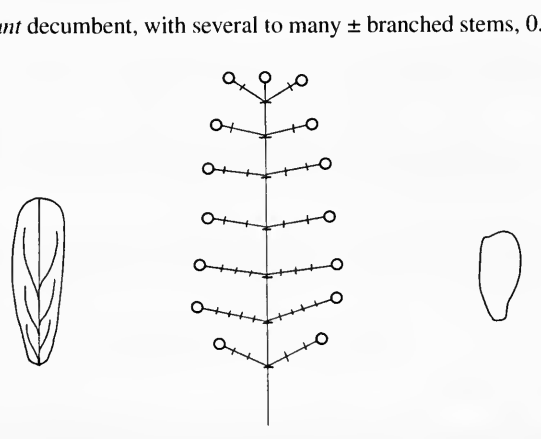
Hypericum stragulum Adams & Robson in *Rhodora* **63**: 15 (1961); W.P. Adams in *Rhodora* **64**: 236 (1962), in *J. Elisha Mitchell scient. Soc.* **89**: 68 (1973); Radford, Ahles & Bell, *Man. vasc. pls Carolinas*: 711 (1968) ['*stragalum*']; nec *H. multicaule* Lam. (1797) nec *H. spathulatum* (Spach) Steud. (1840). Type as for *Ascyrum multicaule* Michx. ex Willd.

H. hypericoides var. *multicaule* (Michx. ex Willd.) Fosberg in *Castanea* **30**: 202 (1965).

H. hypericoides var. *multicaule* (Michx. ex Willd.) Waterfall in *Rhodora* **73**: 553 (1971).

Icon: Mohlenbr., *Ill. Fl. Illinois fl. pls* Hollies to Loasas: 19, f. 6 (1978).

Plant decumbent, with several to many ± branched stems, 0.05–0.3



m long, forming mats. *Leaves* usually oblanceolate (broadest above middle), 10–20 × 3–6 mm. *Inflorescence*-branching dichasial (1–3-flowered) or lateral.

Dry slopes, road embankments and dry to moist rich woods; 70–840 m.

Eastern United States (Massachusetts – Nantucket I. to N. Carolina) westward to south-eastern Kansas, Oklahoma and Texas.

U.S.A. Alabama: Henry Co., Mt Dale, n.d. (fr), *Leas* s.n. (BM); Jackson Co., Bryant, 3 July 1938 (fl), *Porter* s.n. (BM). Arkansas: Montgomery Co., Ouachita National Forest, Mt Ida, 210 m, 5 October 1960 (fr), *Demaree* 42916 (BM); Pope Co., Nogo, 11 September 1932 (fr), *Merrill* 27 (NY). Delaware: New Castle Co., Townsend, 12 August 1911 (fl), *Churchill* s.n. (MO); *Sussex Co., *Long & Bartram* 1572 (PH). Distr. of Columbia: Washington, July 1897 (fl), *Holm* s.n. (H); *Eckington, 14 July 1913 (fr), *Painter* s.n. (MO). Georgia: Fulton Co., College Park, 300 m, 8 August 1961 (fl), *Schallert* 850 (BM); Whitfield Co., Dalton, 255 m, 10 August 1900 (fr), *Harper* 394 (BM, K). Illinois: ? Co., southern Illinois, 1866 (fr), *Vasey* s.n. (BM); *Pope Co., Golconda, 7 October 1919 (fr), *Palmer* 16698 (GH, MO, NY, PH). Indiana: *Clark Co., *Deam* 5414 (IND, NY). Kansas: *Cherokee Co., 7 May 1897 (st), *Hitchcock* 1012 (GH, MICH, MO, NY, US). Kentucky: *Bell Co., mountains around Pineville, August–September 1914 (fr), *Mackenzie* 922 (MO, NY). Louisiana: *Caddo Par., July 1909, *Cocks* s.n. (NO). Maryland: *Ann Arundel Co., *Bartlett* 1838 (MICH); *Calvert Co., S. of Parker's Creek, 4 August 1956 (fl), *Seymour* 16854 (MO). Massachusetts: *Nantucket Co., Nantucket I., *Pennell* 11174 (PH). Mississippi: *Panola Co., 18 April 1898 (fl), *Eggert* s.n. (MO); *Union Co., 23 September 1891, *Seymour* s.n. (DUKE). Missouri: Jasper Co., near Prosperity, Center Creek, 10 October 1923 (fl & fr), *Palmer* 24099 (MO*, Z); Jefferson Co., near Big River, NNE of confluence with Parker Creek, 10.5 km W. of De Soto, *c.* 600 m, 20 July 1985 (fl), *P.H. & T.E. Raven* 26758 (BM, MO*). New Jersey: Atlantic Co., Mays Landing, 31 August 1937 (fr), *Moldenke* 10155 (BM); Burlington Co., *c.* 2.9 km S. of Chatsworth, 20 August 1948 (fl & fr), *Lawrence & Dress* in *Bailey* 558 (BM). New York: *Nassau Co., *Ferguson* 7798 (GH). North Carolina: Macon Co., Highlands, Ravenel Lake, 27 August 1966 (fl), *Bozemann* 7970 (BM, H); Vance Co., Ruin Creek on U.S. 1584, *c.* 6.4 km SW of Henderson, 21 July 1956 (fr), *Ahles* 17322 (H). Ohio: *Adams Co., 23 September 1923, *Roads* s.n. (OS); *Hocking Co., Laurel Twp., SW of Logan, 2 August 1982 (fl), *Lammers* 4815 (MO). Oklahoma: *Carter Co., Sandy Canyon, 9.6 km E. of Ardmore, 31 October 1942 (fr), *Hopkins* 6340 (MO); *Garvin Co., Washita R., near Davis, 29 July 1933 (fl), *Palmer* 42045 (MO). Pennsylvania: *Chester Co., French Creek, July 190- (fr), *Eby* s.n. (MO); *Lancaster Co., Susquehanna R., 22 August 1861, *Porter* s.n. (CM); *York Co., *Adams* 4380 (GH). Tennessee: *Knox Co., Knoxville, July 1895 (fr), *Ruth* s.n. (F, GH, MO); Putnam Co., by T-40 *c.* 8 km W. of Cookeville and junction Tenn. 42, 7 October 1970 (fl & fr), *Kral* 41437 (BM). Texas: *Henderson Co., Eustace, *Lundell & Lundell* 9574 (GH, MICH, NY, SMU); *Tarrant Co., above Bear Creek, W. of Irving, 7 July 1945 (fl), *Lundell* 14030 (MO). Virginia: *Wise Co., Big Stone Gap, 24 July 1891 (fl), *Seymour* 91724 (MO); Norfolk Co., prope Portsmouth, July 1840 (fl), *Rugel* 199 (BM). West Virginia: *Cabell Co., *Gilbert* 548 (DUKE, F, PENN, PH, SMU, TENN, WVA).

29c. **Hypericum hypericoides** subsp. **prostratum** N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 68 (1993). Type: Dominican Republic, San Juan, Sabana Nueva, Cordillera Central N. of Río Arriba del Norte, 1950 m, 17–20 September 1944, *R.A. & E.S. Howard* 9080 (BM!-holotype; GH!, MICH!, NY!, US!-isotypes).

Hypericoides frutescens, humi-fusa, flore luteo Plum., *Nov. pl. amer.*: 52 (1703).

Ascyrum foliis lanceolato-linearibus, biglandulis, ramis diffusis Burm., *Pl. amer.*: 146, t. 152 f. 2 (1758).

Icon: Burm., *Pl. amer.*: t. 152 f. 2 (1758).

Plant prostrate, with stems ± numerous, radiating and branching, forming mats. *Leaves* narrowly oblong to oblong-spathulate, 3–8(–10) × 1–2.5 mm. *Inflorescence*-branching pseudo-dichotomous.

Open *Pinus* forest, grassland and open slopes; (1600–)1800–2900 m.

Dominican Republic (La Vega, Santiago, San Juan, Peravia).

DOMINICAN REPUBLIC. La Vega: Constanza, Ciénaga de la Culata, 1500–1600 m, 28 November 1969 (fr), *Liogier* 17052 (GH, NY, US); vicinity of La Lagunita, 2800–2900 m, 19 July 1967 (fl), *Gastony, Jones & Norris* 317 (GH, NY, US). San Juan: Baoruco, Alto de Toro, 2100 m, 26–27 June 1973 (fl), *A. & L. Liogier* 19751 (NY). Santiago: San José de Ocoa, La Horma Arriba, 1900–2000 m, 1 May 1972 (fr), *Liogier* 18589 (F, NY, US); La Rusilla, 2072 m, 26 March 1964 (fl), *Jiménez* 4918 (US). Peravia: 42 km al NW de San José de Ocoa, nacimiento del Río Las Cuevas en la bas del Monte Tetero de Mejía, 1940 m, 30 May 1984 (fr), *Mejía, Pimentel & García* 610 (BM, JBSD*).

Subsp. *prostratum* is clearly a higher-altitude derivative of the form of subsp. *hypericoides* that occurs at lower levels in the Dominican Republic. Although there is a region between 1600 and 2000 m where both subspecies are present, there appears to be little morphological overlap between them.

Some specimens of subsp. *prostratum* have been determined as *H. constanzae* Urban, but this is a synonym of *H. diosmoides* Griseb. (sect. 29. *Brathys*), see Robson (1990: 37).

Sect. 21. **WEBBIA** (Spach) R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 211 (1893).

Shrubs or sometimes single-stemmed and arborescent, up to 4 m tall, deciduous, glabrous, without dark glands; branching lateral. *Stems* 4-lined and ± compressed (ancipitous) when young, not usually becoming terete in first season, ± glandular, especially on lines; cortex dull reddish brown; bark smooth, pale reddish brown to whitish grey. *Leaves* opposite or abnormally 3-whorled, decussate, sessile, free, deciduous at basal articulation; lamina entire, with venation pinnate, closed, with tertiary reticulation dense; laminar glands punctiform; marginal gland dots dense, relatively large; ventral glands absent. *Inflorescence* up to 30-flowered, with branching dichasial/monochasial from 1–5 nodes, sometimes with flowering branches from up to 7 lower nodes; bracts and bracteoles foliar or ± reduced. *Flowers* stellate, homostylous. *Sepals* 5, partly united, persistent, erect to spreading or subreflexed in fruit, with margin glandular; veins 5–7; laminar glands linear to punctiform; marginal glands very small, sessile or on short cilia; submarginal and inframarginal glands absent. *Petals* 5, persistent, spreading and twisting after flowering, with apiculus obsolete or absent; margin entire; marginal glands absent; laminar glands linear. *Stamen fascicles* 3 (i.e. united 2+2+1), distinct, with stamens 36–75; filaments basally united; anthers yellow, gland amber; pollen type I. *Ovary* with 3 (sometimes incompletely) axile placentae, ∞-ovulate; styles 3, free, bases divaricate; stigmas subclavate to narrowly capitate. *Capsule* 3-valves, coriaceous, with valves finely and obscurely striate. *Seeds* narrowly cylindric or conico-cylindric, not or slightly carinate, apically truncate; testa linear-reticulate to linear-foveolate.

BASIC CHROMOSOME NUMBER (X). 10; ploidy 4.

HABITAT. Evergreen *Laurus* forest, secondary growth after deforestation, and dry bushland on rocky ground; (20–)180–1200 m.

DISTRIBUTION. Canary Islands (all islands except Lanzarote and (probably) Fuerteventura), Madeira.

1 species.

1. **Hypericum canariense** L., *Sp. pl.*: 784 (1753); Miller, *Gard. Dict.* 8th ed. no. 4 corrig. (1768); Lam., *Encycl.* **4**: 155 (1797); Willd., *Sp. pl.* **3**: 1448 (1802); Buch in *Abh. K. Akad. Wiss. Berlin*, Phys. Kl. 1816–1817: 366, 371, 380 (1817); Choisy, *Prodr. monogr. Hypéric.*: 40 (1821), in DC., *Prodr.* **1**: 544 (1824); Trevir., *Hyper. sp. animadv.*: 8 (1861); Masferrer in *An. Soc. esp. Hist. nat.* **9**: 28 (1880); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 211 (1893), 2nd ed. **21**: 176 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: t. 2 f. 7 (1932), **11**: 145 (1933), **12**: 82 (1934), in *Pflanzenareale* **4**: Karte 2a (1933); Lid in *Skr. norske Vidensk.-Akad.* I Math.-Nat. Kl., N.S. No. 23: 119 (1967); Schaeffer, *Pl. Canary Is.*: 146, 147 (photograph) (1967); Kunkel in *Mitt. dt. dendrol. Ges.* **65**: 108 (1972); Voggenr. in *Dissnes. bot.* **26**: 655, 688 (1974); Kunkel, *Endemismos Canarios*: 291 (1977); Bramwell, D. & Z.J., *Wild fls Canary Is.*: 162, f. 198 (1984); I. Hagemann in *Flora* **183**: 242–252, ff. 13–20 (1989); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 70, ff. 11.1, 11.11 (1995). Type: Cult. ex Canary Is., 'Crescit in insulis Canariis', *Hort. Cliff.*: 381, no. 9 (BM!- lectotype; see Wijnands, *Bot. Commelins*: 109, 1983).

Fig. 19, Map 18.

H. floribundum Aiton, *Hort. Kew.* **3**: 104 (1789); Lam., *Encycl.* **4**: 155 (1797); Willd., *Sp. pl.* **3**: 1448 (1802); Buch in *Abh. K. Akad. Wiss. Berlin*, Phys. Kl. 1816–1817: 372, 380 (1817); Choisy, *Prodr. monogr. Hypéric.*: 40 (1821), in DC., *Prodr.* **1**: 544 (1824); Rchb., *Ic. bot. exot.* **1**: 64, t. 95 (1827); Link in Buch, *Phys. Beschr. Canar. Ins.*: 153, 167 (1828); Lowe, *Fl. Madeira*: 76 (1868); Masferrer in *An. Soc. esp. Hist. nat.* **9**: 28 (1880); Menezes, *Fl. Archip. Madeira*: 29 (1914); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 211 (1893), 2nd ed. **21**: 177 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: tt. 1 f. 3, 3 f. 9 (1932), **11**: 145 (1933), **12**: 82 (1934); Grabham, *Pls seen in Madeira*: 94 (1934); Lid in *Skr. norske Vidensk-Akad.*, Math.-Nat. Kl., no. 23: 120 (1967); Kunkel, *Endemismos Canarios*: 293 (1977). Type: Madeira, 1777 (fl), *Masson* s.n. (BM!-holotype & isotype).

H. debile Salisb., *Prodr. stirp. horto Chapel Allerton*: 396 (1796), nom. illegit. (Art. 63.1). Type as for *H. canariense* L.

H. corymbosum Moench, *Methodus*, Suppl.: 41 (1802), nom. illegit. (Art. 63.1). Type as for *H. canariense* L.

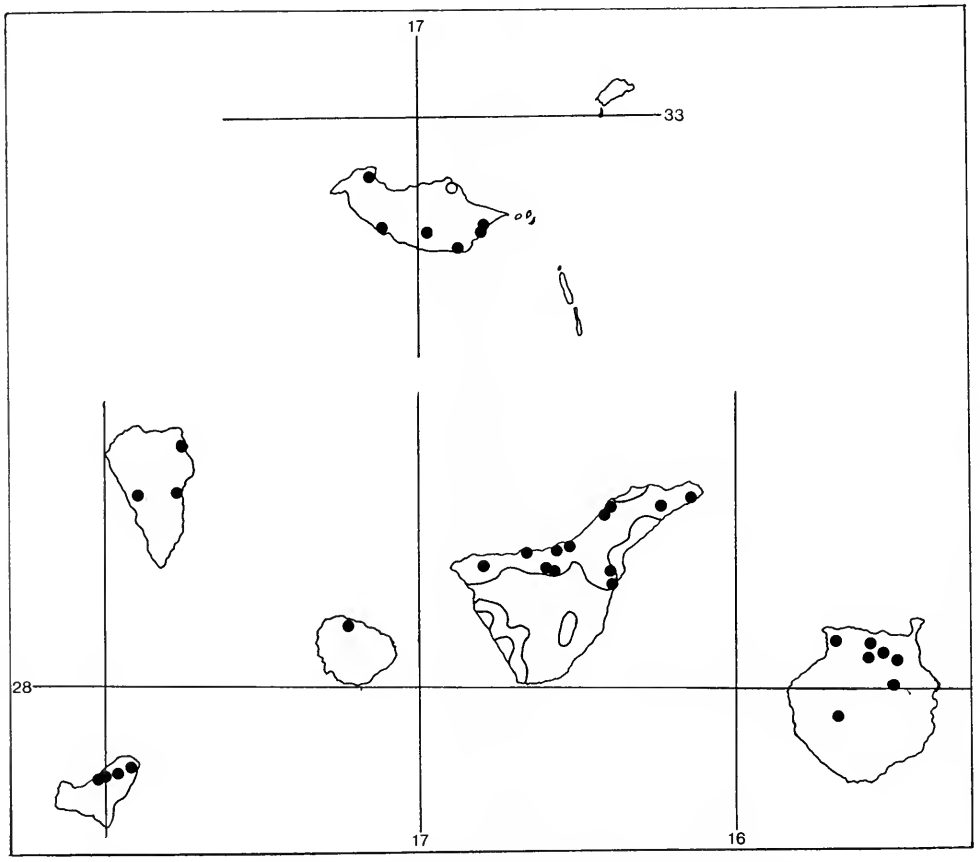
H. canariense var. *montanum* Buch in *Abh. K. Akad. Wiss. Berlin*, Phys. Kl. 1816–1817: 382 (1817) ['*montana*'], nomen.

H. canariense var. [β] *triphyllum* Choisy in DC., *Prodr.* **1**: 544 (1824). Type not found.

H. canariense var. [γ] *salicifolium* Choisy in DC., *Prodr.* **1**: 544 (1824). Type not found.

Webbia floribunda (Aiton) Spach, *Hist. nat. vég.* Phan. **5**: 409 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 356 (1836); Webb & Berth., *Phytogr. canar.* **1**: 47, t. 4B (1836).

W. heterophylla Spach, *Hist. nat vég.* Phan. **5**: 409 (1836). Type: '*Hypericum canariense* Linn.?'.



Map 18 Sect. 21: 1. *H. canariense* ● specimens, O record. Limits on Tenerife according to Voggenreiter (1974).

W. platypetala Spach, *Hist. nat. vég.* Phan. **5**: 410 (1836). Type: cult. in horto Paris. (P-holotype). This is an error for *platysepala*, see below.

W. canariensis (L.) Webb & Berth., *Phytogr. canar.* **1**: 48, t. 4C (1836); Pitard & Proust, *Les Îles Canaries*: 133 (1909).

W. platysepala Spach in *Annls Sci. nat.* (Bot.) II, **5**: 356 (1836); Webb & Berth., *Phytogr. canar.* **1**: 49, t. 4D (1836). Type as for *W. platypetala* Spach.

Hypericum platypetalum (Spach) Steud., *Nomencl. bot.* 2nd ed. **1**: 789 (1840).

H. platysepalum (Spach) Walp., *Repert. bot. syst.* **1**: 386 (1842); Masferrer in *An. Soc. esp. Hist. nat.* **9**: 28 (1880).

H. canariense [var.] α *typicum* Bornm. in *Bot. Jb.* **33**: 452 (1903) ['*typica*']; Ceballos & Ortuño, *Veg. Fl. for. Canar. occid.*: 388 (1951). Type as for *H. canariense* L.

H. canariense [var.] β *floribundum* (Aiton) Bornm. in *Bot. Jb.* **33**: 453 (1903) ['*floribunda*']; Ceballos & Ortuño, *Veg. Fl. for. Canar. occid.*: 388 (1951).

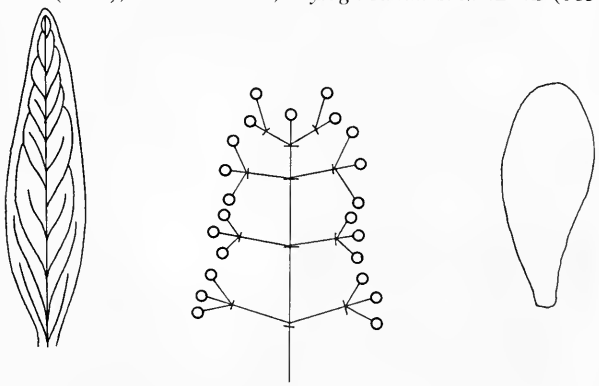
H. canariense [var.] γ *platysepalum* (Spach) Bornm. in *Bot. Jb.* **33**: 453 (1903) ['*platysepala*'].

Webbia canariensis var. [α] *typica* (Bornm.) Pitard & Proust, *Les Îles Canaries*: 134 (1909).

W. canariensis [var.] β *floribunda* (Aiton) Pitard & Proust, *Les Îles Canaries*: 134 (1909).

W. canariensis [var.] γ *platypetala* (Spach) Pitard & Proust, *Les Îles Canaries*: 134 (1909).

Icones: Cooke in *Bot. Cabinet* **10**: t. 953 (1824); Rchb., *Ic. bot. exot.* **1**: t. 95 (1827); Webb & Berth., *Phytogr. canar.* **1**: tt. 4B-4D (1836).



Shrub or tree 1–4 m tall, erect, bushy, with branches erect or ascending. *Stems* green to pale reddish brown, 4-lined when young, soon 2-lined, eventually terete, internodes shorter than leaves; bark becoming whitish then pale grey. *Leaves* sessile; lamina 20–70 × 5–15 mm, narrowly elliptic to narrowly elliptic-oblong, the upper often broader, plane, paler beneath with midrib prominent, not glaucous, chartaceous, deciduous shortly before and during growth of new shoots; apex acute to apiculate-obtuse or rarely rounded, base narrowly cuneate to subangustate; venation: *c.* 8–12 laterals forming looped intramarginal vein, sometimes with subsidiary laterals, ± densely reticulate towards margins, tertiary venation dense and ± obscure; laminar glands dense. *Inflorescence* up to *c.* 30-flowered from up to 5 nodes, sometimes with flowering branches from up to 7 lower nodes immediately below or separated by sterile zone, the whole broadly rounded-pyramidal to broadly cylindric; pedicels 4–10 mm; bracteoles reduced foliar to triangular-subulate. *Flowers* 20–25(–37) mm in diam.; buds narrowly ovoid to narrowly ellipsoid, acute to subacuminate. *Sepals* 3–4.5 × 1–2.2 mm, unequal, varying from lanceolate, acute and basally united to oblong or oblong-spathulate, rounded and *c.* 0.5 united, veins branched distally, laminar glands basally linear, distally punctiform. *Petals* bright yellow, not tinged red, 12–17 × 5–7 mm, *c.* 4 × sepals, oblanceolate-unguiculate, cochleariform, rounded. *Stamens* 10–13 mm long, *c.* 0.7–0.8 × petals. *Ovary* 3–4 × 1.5–2 mm, ellipsoid; styles 8–14 mm, 2.7–4.7 × ovary, basally separated and widely spreading-incurved. *Capsule* (9–)10–12 × 7–8 mm, pyramidal-ovoid to ovoid-ellipsoid, truncate to retuse, with horn-like persistent style bases, exceeding sepals. *Seeds* yellowish brown, 1.5–2 mm long; testa linear-reticulate to linear-foveolate (cf. Reynaud, 1991, f. 1, 3–6). 2n = 40 (Larsen, 1962; Borgen, 1969; Reynaud, 1986; Dalgaard, 1991).

Open rocky slopes, cliffs and ravines, disturbed ground, upper part of litoral zone, relict *Laurus* forest; (20–)180–900(–1200) m.

Canary Islands (all western islands and possibly Fuerteventura), Madeira. The only author to record its presence in Fuerteventura is Voggenreiter (1974: 688, map). Naturalized in the Hawaiian Islands (Maui) and southern California.

CANARY ISLANDS. Tenerife: San Diego de monte, 2 June 1855 (fl), *Bourgeau* 1241 (JE, K); Orotava: The Quinta, St Ursula, March 1929 (fl), *Maude* s.n. (BM); Montañas de Onaga, Barranco de las Huertas, 4 km above San Andres, 8 April 1975 (fl), *J., M. & P. Cannon* 4669 (BM). Gran Canaria: Barranco de los Tiles, April 1846 (fl), *Bourgeau* 675 (BM, K); Miraflor, cerca de Teror, 450 m, 14 April 1969 (fl), *Kunkel* 12747 (BM, H); El Brezal del Palmital, near Moya, 21 July 1972 (fr), *Melville & Bramwell* 72/6 (K). Gomera: below the Cumbre, 6 April 1861 (fl), *Lowe* G110 (BM, K); Valle Hermoso, May 1899 (fl), *Murray* s.n. (K). Hierro: Valverde, to the north, 12 February 1858 (fl), *Lowe* H118 (BM); W. of Frontera, 2 km E. of Sabinosa, 200 m, 12 April 1977 (fl), *Jarvis & Murphy* 260 (BM). La Palma: Barranco del Río, 400 m, 23 March 1905 (fl), *Pitard* 19 (FR, H, JE); near Los Llanos, Barranco de los Angustias, 600 m, 20 April 1977 (fl), *Jarvis, Gibby & Humphries* 397 (BM).

MADEIRA. Ribeiro de Joas Gomez, 300 & 800 m, May to September 1865–1866 (fl), *Mandon* 36 (BM, JE, K); Santa, Ribeiro do Tristão gorge, N. side, 150 m, 22 June 1985 (fl & fr), *Press* 1040 (BM).

HAWAIIAN ISLANDS (naturalized). Maui: East Maui, Kula, 960–1080 m, 18 May 1985 (fl), *Hobdy* 2394 (BISH).

CALIFORNIA (naturalized). Sta Barbara Co., established at Montecito and Santa Barbara (*fide* Munz, 1974: 519).

H. canariense is widely isolated from its nearest relatives in sect. 1. *Campylosporus* on the African mainland, both morphologically and geographically. Its inflorescence is most similar to that of *H. roeperianum*, which occurs in West Africa and has densely reticulate leaf venation; and for those reasons I at first regarded it as the nearest relative of *H. canariense* (Robson, 1981: 68). Hagemann (1989: 242) has pointed out, however, that the growth form of *H. canariense* is much nearer that of the mainly East African *H. revolutum*, which also occurs in the Cameroon mountains and Fernando Poo. I agree and now regard the Canary Island plant as most nearly related to the broader-leaved form of *H. revolutum* in Ethiopia. *H. canariense* differs from it *inter alia* by its broader leaves, more branched inflorescence, smaller flowers with relatively small, pale-gland-fringed sepals, narrower and not orange-tinged petals, fewer stamens (the fascicles grouped 2+2+1), trimerous ovary with relatively longer, spreading and basally distinct styles, and relatively narrower capsule with linear-foveolate rather than linear-reticulate seeds.

The type specimen of *H. canariense* has broad, rounded sepals, whereas in that of *H. floribundum* they are narrow and acute. Spach (1836*a, b*), immediately followed by Webb & Berthelot (1836), recognized an intermediate state; and, as was his wont, regarded the difference between this group and the rest of *Hypericum* as worthy of generic rank. Thus, in order of increasing sepalline acuity, Spach and Webb & Berthelot, between them, described *Webbia canariensis*, *W. platysepala*, *W. heterophylla* and *W. floribunda*. Later workers found *W. platysepala* to be indistinguishable from *W. canariensis*, and the intermediate 'species' *W. heterophylla* was also soon ignored;

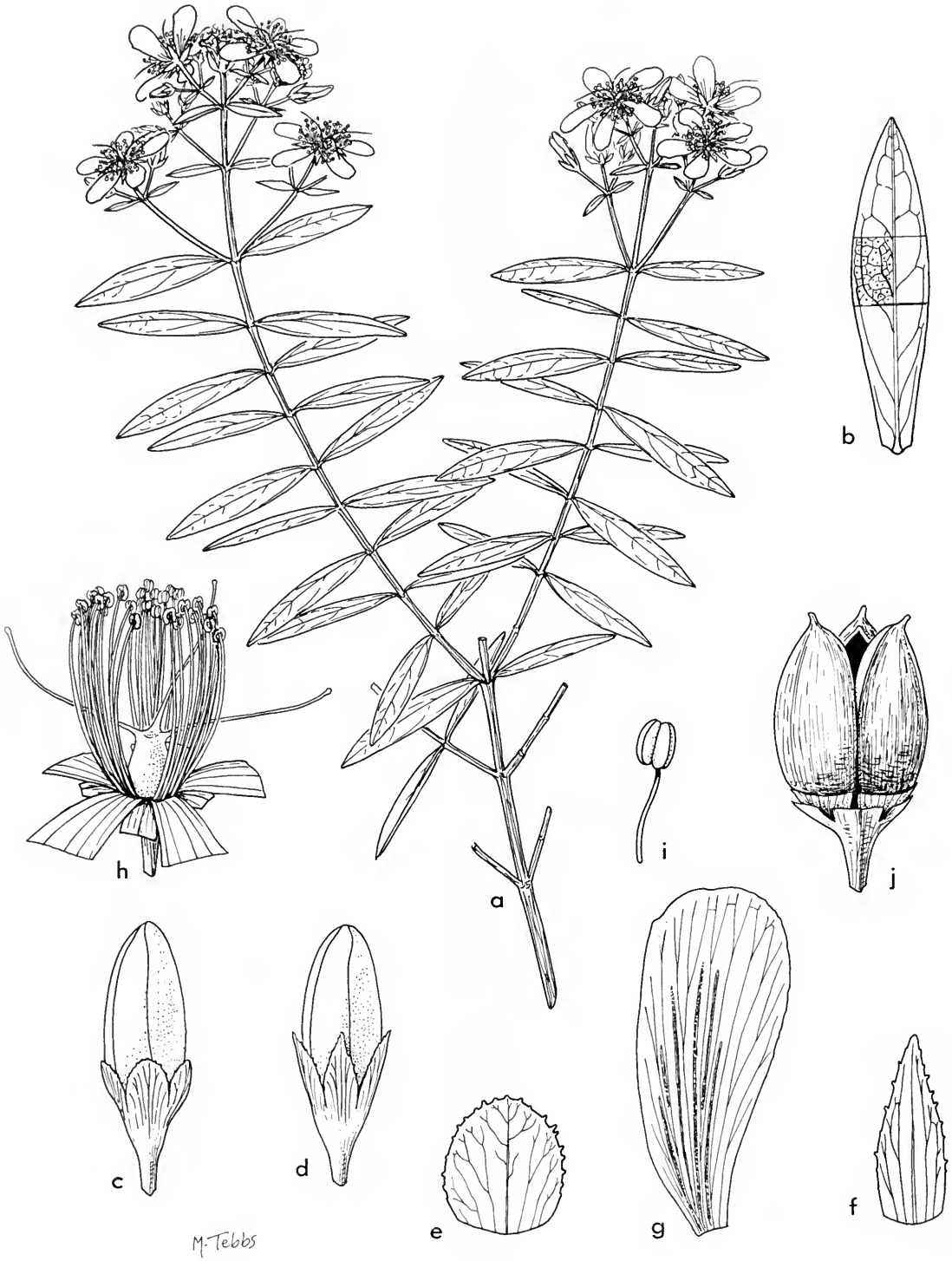


Fig. 19 *H. canariense*: (a) habit; (b) leaf: (c) flower bud ('canariense'); (d) flower bud ('floribundum'); (e) sepal ('canariense'); (f) sepal ('floribundum'); (g) petal; (h) stamens and ovary; (i) anther; (j) capsule (a × ½; b × 1; c, d, h × 2; j × 3; e-g × 4; i × 6). All except d, f. *Jarvis, Gibby & Humphries* 397; d, f. *Cannon* 4669.

so *H. canariense* and *H. floribundum* assumed a rather spurious distinctness. This view was encouraged by the geographical distribution of the extremes: *H. canariense* in Tenerife, Gomera and Hierro, *H. floribundum* in Gran Canaria, La Palma and Madeira. Spach's intermediates do exist, however; and because of their existence and rather irregular distribution, it is not possible to recognize more than one variable species, *H. canariense* L.

Sect. 22. **ARTHROPHYLLUM** Jaub. & Spach, *Ill. pl. orient.* **1**: 44 (1842).

Shrubs, low, compact and rounded to prostrate, up to *c.* 0.9 m tall, eventually deciduous below but never leafless, glabrous, sometimes with reddish to dark glands; branching lateral. *Stems* 2–4(6)-lined and ancipitous when young, soon 2-lined, not usually becoming terete in first season, obscurely glandular; cortex greenish to reddish brown; bark smooth, whitish grey. *Leaves* opposite, decussate, sessile, free or perfoliate, deciduous at basal articulation; lamina entire, with venation pinnate, closed, the tertiary densely reticulate; laminar glands pale, punctiform; marginal glands dots pale, dense, relatively large; ventral glands absent. *Inflorescence* 1–*c.* 40-flowered, with branches dichasial/monochasial from 1–5 nodes, without lower flowering branches; bracts and bracteoles reduced, entire or black-gland-fringed. *Flowers* stellate, homostylous. *Sepals* 5, free or basally connate, imbricate above, persistent, erect in fruit, with margin entire or reddish- to black-gland-fringed; laminar glands linear; marginal glands sessile or on short denticles or submarginal; inframarginal glands absent. *Petals* 5, persistent, spreading and twisting after flowering, with apiculus obsolete or absent; margin entire; marginal glands absent; laminar glands linear to punctiform or rarely absent. *Stamen fascicles* 3 (i.e. united 2+2+1), distinct, persistent, with stamens 20–40; filaments basally united; anthers yellow, gland amber; pollen types I, IV. *Ovary* with 3 axile placentae, ∞-ovulate; styles 3, free, bases separate; stigmas narrow or narrowly capitate. *Capsule* 3-valved, subcoriaceous, with valves longitudinally vittate. *Seeds* narrowly cylindric, ecarinate; testa minutely rugulose.

BASIC CHROMOSOME NUMBER (X). Unknown.

HABITAT. Crevices in calcareous rocks, 100–1800 m.

DISTRIBUTION. S. Turkey, Syria, Lebanon.

5 species.

Key to sect. 22. *Arthrophyllum*

1 Sepals and bracts with marginal, reddish or black glands 2

Sepals and bracts without marginal glands 3

2(1) Leaves free, lanceolate to narrowly ovate or oblong-elliptic, apex rounded; sepals ovate to oblong, 0.35–0.5 united, marginal glands black ..... 1. **rupestre**

Leaves perfoliate, almost completely united, broadly ovate to oblong-ovate, apex acute; sepals lanceolate, almost free or up to 0.35 united, marginal glands reddish ..... 2. **pamphylicum**

3(1) Leaves (at least middle and upper) with base cordate-amplexicaul; flowers numerous, in dense corymbiform cymes ..... 3. **cardiophyllum**

Leaves all with base cuneate to rounded; flowers 1–9, solitary or in lax corymbiform cymes 4

4(3) Sepals acute to shortly acuminate, lanceolate; leaves subcoriaceous, venation not or scarcely prominent; flowers usually 2–9 (4. **nanum**) 5

Sepals rounded to subacute, oblong to ovate; leaves chartaceous, venation prominent on both sides; flowers usually solitary ..... 5. **vacciniifolium**

5(4) Stems erect, plant bushy; leaves ovate to broadly elliptic or orbicular; inner sepals triangular-lanceolate to narrowly oblong ..... 4a. **nanum** var. **nanum**

Stems prostrate, plant appressed; leaves broadly to narrowly elliptic; inner sepals ± broadly ovate ..... 4b. **nanum** var. **prostratum**

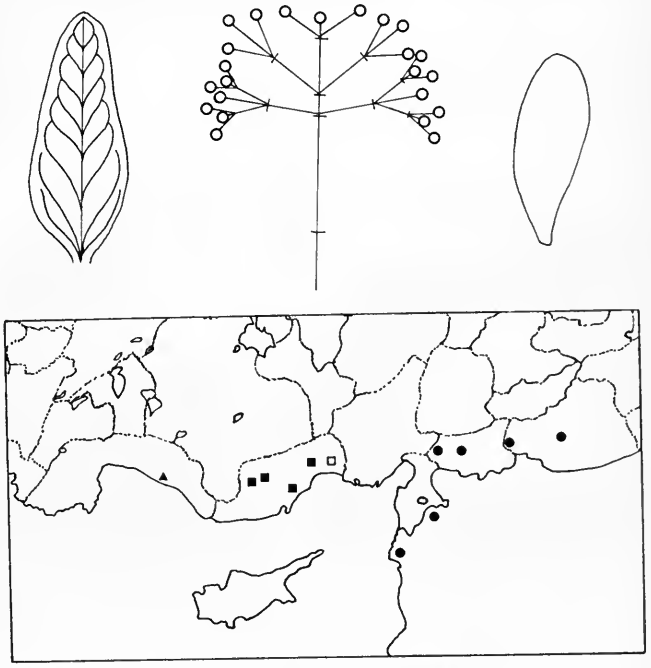
1. **Hypericum rupestre** Jaub. & Spach, *Ill. pl. orient.* **1**: 44, tt. 21, 22 (1842); Boiss., *Fl. orient.* **1**: 792 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 147 (1933), **12**: 82 (1934), in *Pflanzenareale* IV, **1**: Karte 2a (1933); N. Robson in P. Davis, *Fl. Turkey* **2**: 368, f. 11/5 (1967); Greuter, Burdet & Long, *Med-Checklist* **3**: 272 (1968). Types: Turkey [Mersin], 'in rupibus abruptis Ciliciae', [1834] (fl), *Aucher* 873 pro parte (P-lectotype, selected here; BM!, G!, K!); 'in rupibus montes Tauri', 1834 (fl), *Montbret* s.n. (FI, K!-syntypes). Jaubert & Spach described and illustrated two varieties without attributing their cited specimens to them. The Kew syntypes of both collections include twigs with the upper leaves elliptic ('*ovalifolia*') and the lower ones suborbicular ('*rotundifolia*').
Fig. 20D, Map 19.

H. rupestre [var.] α *rotundifolium* Jaub. & Spach, *Ill. pl. orient.* **1**: 44, t. 21 (1842) ['*rotundifolia*']. Type (see above): Turkey, Cilicia, 1834 (fl), *Montbret* s.n. (FI-holotype; K!).

H. rupestre [var.] β *ovalifolium* Jaub. & Spach, *Ill. pl. orient.* **1**: 44, t. 22 (1842) ['*ovalifolia*']. Type (see above): Turkey, Cilicia, [1834] (fl), *Aucher* 873 pro parte (P-holotype; BM!, G!, K!).

Icones: Jaub. & Spach, *Ill. pl. orient.* **1**: tt. 21, 22 (1842).

Shrub up to *c.* 0.3 m(?) tall, erect, bushy rounded, with branches



Map 19 Sect. 22. 1. *H. rupestre* □; 2. *H. pamphylicum* ▲; 3. *H. cardiophyllum* ●; 5. *H. vacciniifolium* ■.

erect or ± tortuous. *Stems* 4-lined and green when young; cortex becoming red-brown and flattened in second year, then bark grey. *Leaves* sessile; lamina 17–45 × 9–15 mm, lanceolate to elliptic or suborbicular, paler beneath, midrib prominent proximally below, ± glaucous beneath, rigidly coriaceous, deciduous during second year; apex obtuse to rounded or (the lower) retuse, base broadly cuneate to subattenuate; venation: *c.* 8–12 pairs of laterals, scarcely distinct from tertiary reticulation. *Inflorescence* 9–16-flowered from (1)2(3) nodes, subcorymbiform; pedicels 2.5–6 mm; bracteoles triangular-subulate, margin black-glandular-ciliate. *Flowers c.* 20–25 mm in diam.; buds elliptic, rounded. *Sepals* 2–3 × 0.7–1.2 mm, unequal to subequal, 0.4–0.5 united, ovate to oblong-lanceolate or broadly elliptic, subacute to rounded, margin distally or wholly with sessile black glands; veins 5–7, subprominent. *Petals* bright yellow, not red-tinged, 10–14 × *c.* 5–7 mm, *c.* 5 × sepals, obovate to oblanceolate, asymmetrically retuse; laminar glands linear. *Stamens* 30–40, longest *c.* 9–13 mm, almost equalling petals. *Ovary c.* 3 × 1.5 mm, ellipsoid; styles *c.* 10–12 mm long, 3–4 × ovary, widely curved-ascending; stigmas narrowly capitate. *Capsule c.* 7 mm long, exceeding sepals, narrowly ovoid. *Seeds* not seen.

Limestone cliffs; 150 m.

Turkey (Içel).

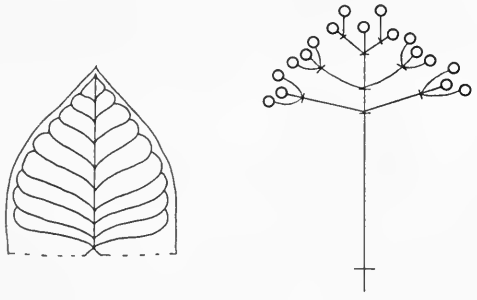
TURKEY. Içel: Tarsus distr., gorge of Tarsus R. between Ulas and Samlar, 150 m, 5 April 1957 (fl), *Davis & Hedge* D.26461 (BM, E, K).

Exsiccatae of *Aucher* 873 were labelled 'Syria' in error. *H. rupestre* appears to be restricted to a small area in vilayet Içel, where it is rare.

Apart from the apomorphic black-glandular margins of the bracteoles and sepals and the partial union of the sepals, *H. rupestre* would seem to be the nearest species in sect. *Arthrophyllum* to *H. canariense* morphologically and (except for 2. *H. pamphylicum* and 5. *H. vacciniifolium*) geographically. As *H. canariense* has sepals with minute pale marginal glands, Spp. 1 and 2 of sect. *Arthrophyllum* may be regarded as having better developed marginal glands, whereas Spp. 3–5 have apparently lost them.

2. **Hypericum pamphylicum** N. Robson & P. Davis in *Notes R. bot. Gdn Edinb.* **38**: 104 (1980); N. Robson in P. Davis, *Fl. Turkey* **10**: 96 (1988); Greuter, Burdet & Long, *Med-Checklist* **3**: 270 (1986). Type: Turkey, Antalya, Alarahan, 7 km inland from coast road between Manavgat and Alanya, beneath castle, 100 m, 11 May 1979 (fl), *Matthew, Baytop & Sütlüpinar* 9599 (BM!-holotype; E!, ISTF, K!-isotypes).

Fig. 20B, Map 19.



Shrub c. 0.14–0.25 m tall, with branches decumbent. *Stems* slightly 2-lined and green when young, soon terete; cortex becoming reddish brown, then bark grey in second year. *Leaves* in almost completely perfoliate pairs; lamina 18–35 × 14–35 mm, broadly ovate or broadly oblong-ovate, paler beneath, midrib slightly prominent beneath, glaucous, subcoriaceous, deciduous during second year; apex acute to apiculate-obtuse or rounded, base united; venation: 3–4 pairs of laterals, scarcely distinct from tertiary reticulation. *Inflorescence* 5–20-flowered from (1)3–4 nodes, hemispheric to subcorymbiform; pedicels 3–4 mm; bracteoles lanceolate-subulate, margin red-glandular-denticulate. *Flowers c.* 20 mm in diam.; buds elliptic, obtuse to subacute. *Sepals* 3–3.5 × 0.7–1 mm, unequal, almost free to 0.35 united, lanceolate to narrowly oblong, obtuse to rounded, margin red-glandular-denticulate, veins 5, not or scarcely prominent. *Petals* bright yellow, not red-tinged, 11–12(–14) × 3 mm, *c.* 4 × sepals, lanceolate to narrowly oblong, rounded; laminar glands striiform. *Stamens* 21–26, longest 10–14 mm long, about equalling petals. *Ovary* 3 × 1.5 mm, narrowly ovoid; styles *c.* 10 mm long, *c.* 3.5 × ovary, narrowly curved-ascending; stigmas narrowly capitate. *Capsule* and *seeds* unknown.

Limestone rocks; 100 m.

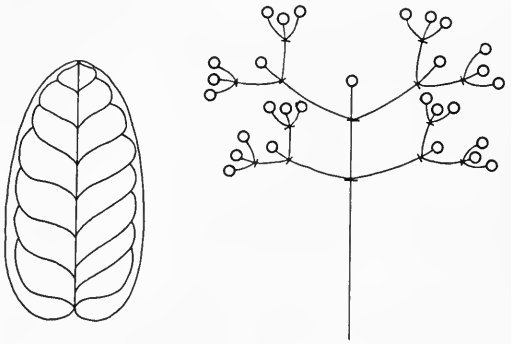
Turkey (Antalya).

TURKEY. Antalya: Alarahan, 7 km inland from coast road between Manavgat and Alanya, 100 m, 11 May 1979 (fl), *Matthew, Baytop & Sütlüpinar* 9599 (BM, E, ISTF*, K).

H. pamphylicum has been collected only once. It is clearly closely related to *H. rupestre*, in relation to which all its characters are apomorphic with the possible exception of the red (as opposed to black) glands.

3. **Hypericum cardiophyllum** Boiss., *Fl. orient.* **1**: 791 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925); Boul., *Fl. Liban*: 68 (1930); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 147 (1933), **12**: 82 (1934), in *Pflanzenareale* IV, **1**: 2a (1933); J. Thiébaut, *Fl. Lib.-Syr.* **1**: 139 (1936); N. Robson in P. Davis, *Fl. Turkey* **2**: 367, f. 11/4 (1967); Mouterde, *Nouv. Fl. Liban. Syrie* **2**: 521 (1970); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986). Types: Syria, 'Darkusch ad Orontem in via ab Antiochia ad Aleppo', June 1846?, *Boissier* s.n. (G!-syntype); Turkey, Gaziantep, 'Assy prope Aintab, etiam prope Urfa', 600 m, 24 June 1865 (fl & fr), *Haussknecht* s.n. (G!-lectotype, selected here; K!-isolectotype). Haussknecht collected this species in two localities, but it is not clear from which the type came; perhaps specimens from both localities were mounted. He subsequently distributed exsiccatae of both collections: 'Ad rupes Assy prope Aintab' (*Haussknecht* 603) and 'In cacumine Montis Nar Facub, prope Orfa' (*Haussknecht* 663). These may be duplicates of the lectotype.

Map 19.



Shrub 0.12–0.9 m tall, erect, bushy, rounded, with branches erect to ascending. *Stems* 2-lined and green when young; cortex loosening and becoming whitish in second year, then bark pale grey. *Leaves* sessile; lamina (15–)20–45 × 10–30 mm, oblong or elliptic to ovate or lanceolate, almost concolorous, midrib scarcely prominent, ±

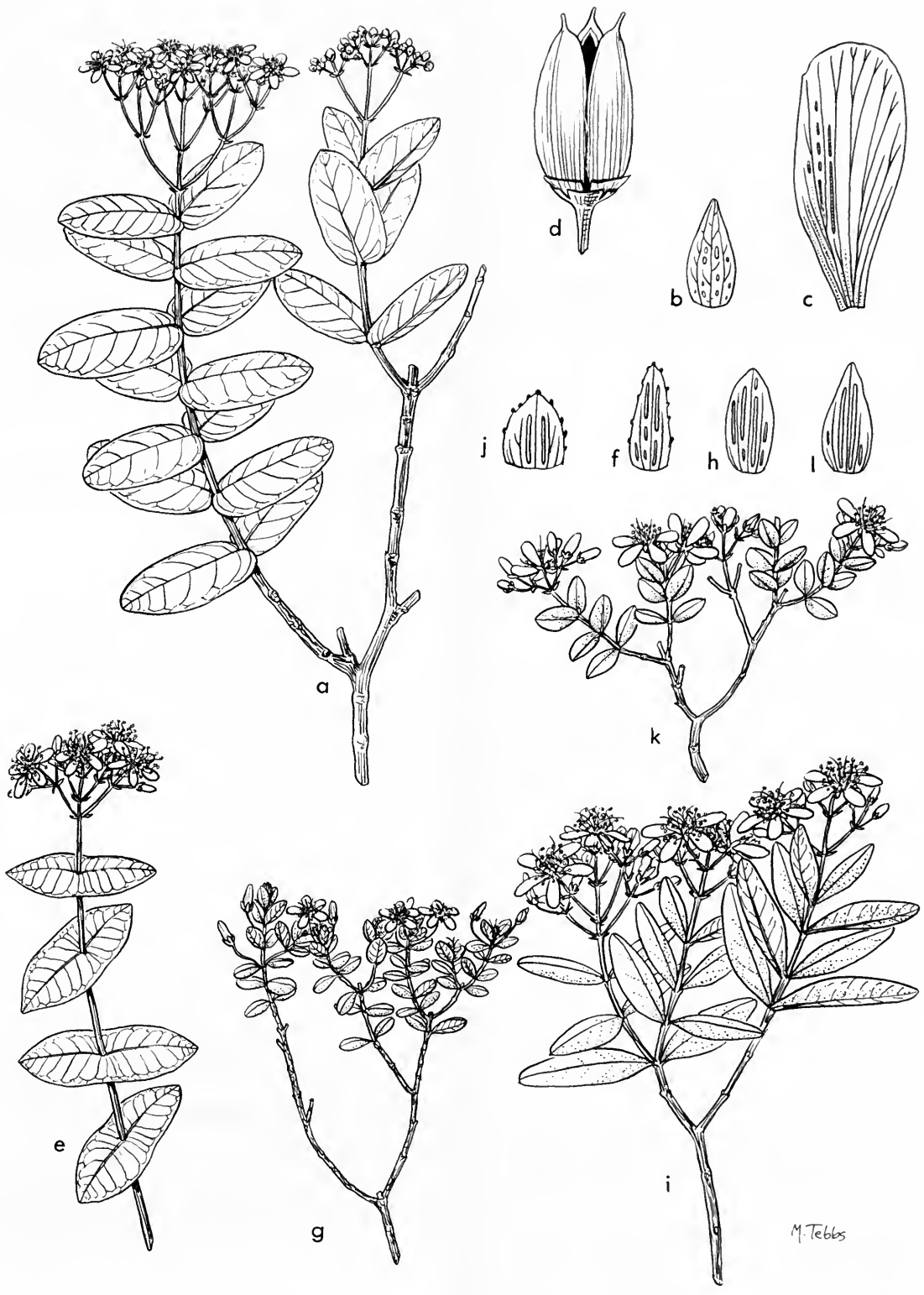


Fig. 20 A. *H. cardiophyllum*: (a) habit; (b) sepal; (c) petal; (d) capsule. B. *H. pamphylicum*: (e) habit; (f) sepal. C. *H. vacciniifolium:* (g) habit; (h) sepal. D. *H. rupestre:* (i) habit; (j) sepal. E. *H. nanum*: (k) habit; (l) sepal (a, e, g, k × ½; all others × 4). A. *Post* s.n. B. *Mathew* et al. 9599. C. *Siehe* 226. D. *Davis & Hedge* 26461. E. *Norris* s.n.

glaucous especially beneath, thinly coriaceous, deciduous before (?) growth of new shoots; apex obtuse to rounded, base truncate to cordate-amplexicaul; venation: 5–6 pairs of laterals, scarcely distinct from tertiary reticulation. *Inflorescence c.* 10–40-flowered from 3(–5) nodes, corymbiform to broadly hemispherical; pedicels 2–3 mm; bracteoles triangular-subulate, margin entire. *Flowers c.* 16–20 mm in diam.; buds elliptic, obtuse. *Sepals* 2–4 × 0.9–2 mm, subequal, free, triangular-ovate to oblong-lanceolate, acute to subacute or sometimes rounded, entire, glands submarginal; veins 5, not prominent. *Petals* bright yellow, not tinged red, 9–12 × (2.5–)5–7 mm, 3–4.5 × sepals, obovate to elliptic, rounded; laminar glands striiform to punctiform. *Stamens* 20–30, longest 9–12 mm, about equalling petals. *Ovary c.* 1.5–2 × 1–1.5 mm, ovoid; styles *c.* 9–11 mm long, *c.* 4 × ovary, widely spreading; stigmas narrow. *Capsule* 4.5 × 2.5–3.5 mm, very narrowly ovoid to cylindric, truncate, with persistent horn-like style bases, exceeding sepals. *Seeds* yellowish brown, *c.* 1.2 mm long.

Open calcareous rocks; 500–1000 m.

TURKEY. Gaziantep: Osmaniye to Gaziantep, 48 km W. of Gaziantep, 950–1000 m, 24 June 1953 (fl), *Huber-Morath* 12087 (BASBG); *c.* 4 km N. of Halfeti, 500 m, 24 May 1983 (fl), *Sorger* 83–5–3 (W); Aintab [Gaziantep], ad rupes Assy prope Aintab, 24 June 1865 (fl), *Haussknecht* 603 (BM, E, G, JE, K); Aintab, 15 June 1882 (fr), *Post* s.n. (BM). Urfa: 5 km NE of Halfeti, 650 m, 30April 1980 (e. fl), *Sorger* 80–14–48 (W); Orfa [Urfa], in rupestribus calcareis, 24 June 1867 (fl), *Haussknecht* s.n. (BM); in cacumine montis Nar Facub, prope Orfa, 15 May 1865 (fl), *Haussknecht* 663 (JE).

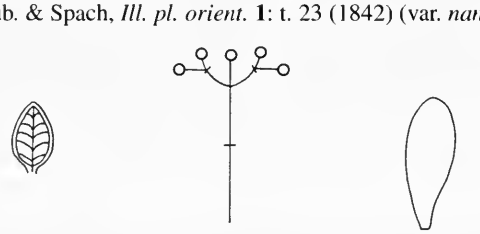
SYRIA. Latakia [Al Ladhiqiyah]: ad rupes prope Latakieh, June 1846 (fl), *Boissier* (K, UPS); no precise locality, 1846 (fl), *Pinard* s.n. (BM, H, K); Darkhush [on R. Orontes], June 1865? (fl), *Boissier* s.n. (G).

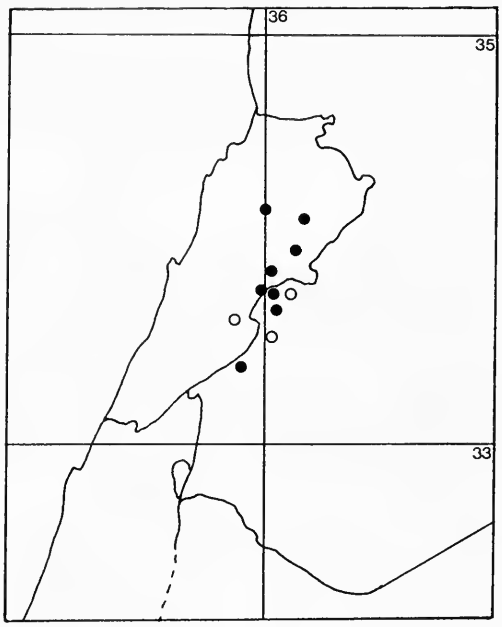
H. cardiophyllum has most of the characters of *H. canariense* in miniature or in reduced numbers, except for the corymbiform inflorescence and differently shaped glaucous leaves. The truncate to cordate leaf-base and entire acute sepals distinguish it from other species in sect. *Arthrophyllum*. The flowers are somewhat smaller and more crowded than those of 1. *H. rupestre*, and it lacks the dark glands found in that species.

4. **Hypericum nanum** Poir., *Encycl.*, Suppl. **3**: 699 (1814); Choisy, *Prodr. monogr. Hypéric.*: 49 (1821), in DC., *Prodr.* **1**: 549 (1824); Spach in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836); Jaub. & Spach, *Ill. pl. orient.* **1**: 46, t. 23 (1842); Boiss., *Fl. Orient.* **1**: 792 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925); Boul., *Fl. Liban*: 69, t. 68 f. 3 (1930); Post, *Fl. Syria* 2nd ed. **1**: 229 (1932); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: tt. 1 f. 4, 2 f. 8, 3 f.10 (1932), **11**: 146 (1933), **12**: 82 (1934), in *Pflanzenareale* IV, **1**: Karte 2a (1933); J. Thiébaut, *Fl. Lib.-Syr.* **1**: 140 (1936); Oppenheimer & Evenari in *Bull. Soc. bot. Genève* **31**: 324 (1940); Zohary, *Fl. Palaestina* **1**: 222 (1966); Mouterde, *Nouv. Fl. Liban Syrie* **2**: 521, t. 224 f. 4 (1970); Greuter, Burdet & Long, *Med-Checklist* **3**: 269 (1986); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 70, ff. 11.3, 11.13 (1995). Type: Lebanon, 'Syria', no precise locality [Cossayé?], *de Labillardière* (P-holotype; ?H! – see below).

Fig. 20E, Map 20.

Icon: Jaub. & Spach, *Ill. pl. orient.* **1**: t. 23 (1842) (var. *nanum*).





Map 20 Sect. 22. 4. *H. nanum* ● specimens, □ records.

Shrub c. 0.15–0.3 m tall, erect, bushy, rounded ('hemispherical'), with branches erect or ± tortuous or sometimes prostrate with stems appressed against rocks. *Stems* 4-lined and green when young, soon 2-lined to terete; bark greyish to whitish grey. *Leaves* sessile; lamina 5–20(–25) × 4–15(–18) mm, ovate or broadly oblong-ovate or orbicular to broadly or narrowly elliptic, somewhat paler beneath, midrib prominent beneath, ± glaucous when young, sometimes persistently so beneath, subcoriaceous, deciduous during second year; apex obtuse or subapiculate to rounded or rarely retuse, base rounded to cuneate or more rarely shortly angustate; venation: 4–6 pairs of laterals, scarcely distinct from tertiary reticulation. *Inflorescence* 2–9-flowered from 1–2 nodes, rounded-corymbiform; pedicels 4.5–9 mm; bracteoles triangular-subulate, margin entire. *Flowers c.* 12–20 mm in diam.; buds ellipsoid, rounded. *Sepals* 2–3(–3.5) × 0.5–1 mm, subequal to unequal, free or up to 0.2 united, triangular-lanceolate to narrowly oblong or rarely ovate, acute or subacuminate to subacute, margin entire or with distal marginal glands ± protruding, veins 5, at least midrib prominent. *Petals* bright yellow, (6–)8–10(–12) × *c.* 2–4.5 mm, *c.* 3–4 × sepals, oblanceolate to narrowly cuneate, asymmetrically retuse; laminar glands striiform to punctiform or absent. *Stamens* 30–40, longest *c.* 8–10 mm, about equalling petals. *Ovary c.* 2–3 × 1–1.5 mm, narrowly ovoid; styles 9–12 mm long, *c.* 3–5 × ovary, narrowly curved-ascending; stigmas narrow. *Capsule* 5–6.5(–8) × 3–4.5(–6) mm, cylindric-ovoid, apically impressed. *Seeds* not seen.

Calcareous rocks; (750)900–1800 m.

Lebanon (Lebanon and Antilebanon mts), Syria (Antilebanon).

H. nanum exists in two growth forms which, unless or until they are shown to merge, are best treated as varieties.

4a. **Hypericum nanum** var. **nanum**

Stems erect, forming rounded bushes. *Leaves c.* 10–20 mm long, ovate or oblong-ovate or orbicular to broadly elliptic, subapiculate or rounded to retuse. *Inflorescence* 3–9-flowered. *Sepals* (2–)2.5–3.5 mm long, the inner triangular-lanceolate to narrowly oblong.

Range of species; 750–1800 m.

LEBANON. Qadisha gorge below Becharre [Bsharri], 900–1050 m, 19 August 1945 (fr), *Davis* 10149 (BM, K); Cossayé [Kassâyer?], [1787] (fl), *de Labillardière* s.n. (H) – cf. type. Antilebanon: Wadi Jemayli (above Baalbek), 1350–1800 m, 23 June 1943 (fl), *Davis* 6582 (BM, K); near Rukhby [Rukhbi], 14 July 1890 (fl), *Post* s.n. (E, K).

SYRIA. Antilebanon circa Zebdaine [Zebdani] prope Damascum, decus parientum imminentium vallis Uod e Uom, 1200 m, 7 June 1855 (fl), *Kotschy* 68 (BASBG, BM, K, UPS); Hermon, 1200 m, May 1945? (fl), *Norris* (BM).

The Bsharri collection has larger flowers and leaves than the others, the leaves having a distinct angustate base and (mostly) retuse apex. The collection was originally determined as *H. rupestre*, and the leaves do resemble those in Jaubert & Spach's (1842) figure of their var. '*rotundifolia*'; but the sepals and bracteoles are entire as in *H. nanum*.

4b. **Hypericum nanum** var. **prostratum** Boiss., *Fl. orient.* **1**: 792 (1867); Post, *Fl. Syria* 2nd ed. **1**: 229 (1932); Rech. f. in *Ark. Bot.* **5**: 292 (1960); Mouterde, *Nouv. Fl. Liban Syrie* **2**: 521 (1970). Type: Lebanon, Antilebanon, rochers au bords du Barrada entre Bessime [Bassima] et Ain Fige [Ain el Fiji], 18 May 1817 (fl), *Gaillardot* 1676 (G-holotype; JE!).

Stems prostrate, appressed to rocks. *Leaves* 5–12 mm long, broadly to ± narrowly elliptic, obtuse to rounded. *Inflorescence* 2–5-flowered. *Sepals* 2–2.5 mm long, the inner ± broadly ovate.

LEBANON. Antilebanon: prope Aïn Yunûn, 1600 m, 21 May 1910 (fl), *J. & F. Bornmüller* 11519 (BM, JE); Falita (above Nabh), 1650 m, 21 June 1943 (fl), *Davis* 6582 (BM, K).

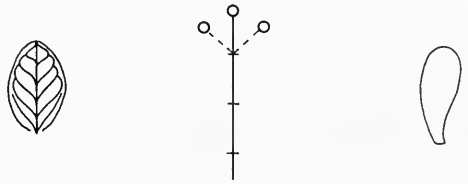
SYRIA. Antilebanon: S. of Aïn el Fiji, 20 km NW of Damascus along Barada valley, 5 May 1963 (fl), *Barkoudah* 741 (E).

The shape and angustate base of the leaves of the Bsharri population (q.v. supra) suggest that *H. nanum* is directly related to *H. rupestre* rather than to *H. cardiophyllum*, in which the entire sepals, smaller flowers and cordate leaf-bases may therefore be regarded as apomorphic in relation to *H. rupestre*.

5. **Hypericum vacciniifolium** Hayek & Siehe in *Annln naturh. Mus. Wien* **28**: 159, t. 11 f. 3 (1914); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 146 (1933), **12**: 82 (1934), in *Pflanzenareale* IV, **1**: Karte 2a (1933); N. Robson in P. Davis, *Fl. Turkey* **2**: 368 (1967); Greuter, Burdet & Long, *Med-Checklist* **3**: 274 (1986); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 70 (1995). Type: Turkey, Vil. Adana [Içel], Sandjak Mersina, bei Efrenk, 1500 m, June 1912 (fl), *Siehe* 226 (W-holotype; BM!, E!, JE!, Z!-isotypes). Fig. 20C, Map 19.

H. nanum var. *uniflorum* Bornm. in sched.

Icon: Hayek & Siehe in *Annln naturh. Mus. Wien* **28**: 159, t. 11 f. 3 (1914).



Shrub 0.08–0.2 m tall, erect, bushy, rounded, with branches ± tortuous. *Stems* 2-lined when young, soon terete; bark greyish brown to whitish grey. *Leaves* sessile or with pseudopetiole up to c. 0.7 mm; lamina 6–15 × 3.5–9 mm, elliptic or oblong-elliptic to obovate, somewhat paler but not or scarcely glaucous beneath, midrib and reticulate venation ± prominent on both sides, chartaceous, deciduous during second year; apex obtuse or subapiculate to rounded, base cuneate to angustate or shortly pseudopetiolate; venation: 3–6 pairs of major and minor laterals, ± distinct from tertiary reticulation. *Inflorescence* 1–3(–9)-flowered, from 1–2 nodes, rounded-corymbiform when several-flowered; pedicels 4–7 mm; bracteoles triangular-subulate, margin entire. *Flowers* c. 15–18 mm in diam.; buds ellipsoid, rounded. *Sepals* 2–4 × 1.3–1.7 mm, unequal, shortly united, oblong to ovate, subacute to rounded, margin entire, glands submarginal, veins 3–5, not prominent. *Petals* bright? yellow, 10–12 × 4–5 mm, 3–4 × sepals, oblong-lanceolate, unequally retuse; laminar glands linear to punctiform. *Stamens* c. 20, longest c. 11–12 mm, about equalling petals. *Ovary* c. 2.5 × 1.5 mm, narrowly ovoid-ellipsoid; styles 8–9 mm long, c. 3–4 × ovary, narrowly curved-ascending; stigmas narrow. *Capsule* (immature) ovoid. *Seeds* not seen.

Limestone cliffs; 1000–1500 m.

Turkey (E. Cilicia).

TURKEY. Içel: Mut – Kirobasi, 33 km, 1260 m, 14 June 1950 (fl), *Attila* in *Hub.-Mor.* 11489 (BASBG); Mut to Büyük Eğri Dağh, 1500 m, 12 May 1965 (fl), *Coode & Jones* 883 (E, K); Lamas-Schlucht, 1000 m, 12 June 1912 (fl), *Siehe* s.n. (JE).

H. vacciniifolium is closely related to the Libano-Syrian *H. nanum*, differing essentially from it in the thinner leaves with prominent venation and angustate to pseudopetiolate base and the smaller number of stamens, and usually in the fewer (often only 1)-flowered inflorescence and relatively broader, less acute sepals. It is confined to a small area of the Taurus Mountains in eastern Cilicia (vilayet Içel).

Sect. 23. **TRIADENIOIDES** Jaub. & Spach, *Ill. pl. orient.* **1**: 49 (1842).

Shrubs or shrublets, erect to prostrate, up to c. 0.6 m tall, deciduous below but never wholly leafless, glabrous or rarely with innovations and lower surface of leaves puberulous, sometimes with dark glands; branching lateral. *Stems* 4–6-lined and ± compressed (ancipitous) when young, becoming terete in second season, eglandular or rarely with a few dark glands; cortex green to red; bark smooth to finely ribbed-striate, grey-brown to red-brown. *Leaves* opposite or 3-whorled, decussate, sessile or petiolate, free, deciduous at basal articulation; lamina entire, with venation pinnate and partly open or 1-nerved, the tertiary reticulation obscure (or absent?); laminar glands pale or rarely dark, punctiform; submarginal dark glands rarely present; marginal or intramarginal gland dots pale, dense or rather sparse, similar to laminar ones; ventral glands absent. *Inflorescence* 1–13-flowered, with branches dichasial/monochasial (sometimes subopposite) from 1–2 nodes or subumbellate, without lower flowering branches; bracts and bracteoles reduced or bracts foliar, entire. *Flowers* stellate, homostylous. *Sepals* 5, free or slightly basally connate, persistent, erect to recurved in fruit, with margin entire or rarely dark-gland-fringed; veins 3–7; laminar glands pale, linear to punctiform; marginal glands on denticles or subsessile or absent; submarginal glands absent or dark; inframarginal glands absent. *Petals* 5, persistent, spreading or erect but not twisting after flowering, with apiculus subterminal, short or absent; margin entire; marginal glands absent, laminar glands linear to punctiform, pale or rarely reddish to black. *Stamen fascicles* 3 (i.e. united 2+2+1), distinct, persistent, with stamens (10–)20–40(–60); filaments basally or up to c. 0.4 united; anthers yellow, gland amber or rarely black; pollen types IV, VI. *Ovary* with 3 loosely axile placentae, each many- to few-ovulate; styles free, bases distinct, contiguous; stigmas narrowly to scarcely capitate. *Capsule* 3-valved, coriaceous to subcoriaceous, with valves ± prominently longitudinally vittate or

verrucose. *Seeds* narrowly cylindric, narrowly or not carinate, proximally ± complanate; testa reticulate-foveolate to linear-foveolate or rugulose.

BASIC CHROMOSOME NUMBER (X). 8; ploidy 2.

HABITAT. Limestone or less commonly conglomerate or granitic rocks or slopes; 0–1900 m.

DISTRIBUTION. Socotra, south Turkey, Syria, Lebanon.

5 species.

Key to sect. 23. *Triadenioides*

1 Leaves discolorous, paired; dark glands absent 2

Leaves concolorous, 3-whorled or with dark glands 4

2(1) Leaves whitish-puberulous beneath and young parts fawn-puberulous; all leaves petiolate, triangular-ovate to oblong-ovate ..... 1. **fieriense**

Leaves pruinose to whitish-puberulous beneath or whole plant glabrous; all or some leaves sessile, elliptic or oblong to obovate 3

3(2) Flowers 1(2), terminal and in axils of older leaves; sepals ensiform; capsule valves vittate; habit erect ..... 2. **scopulorum**

Flowers 7–13 in terminal subumbellate inflorescence: sepals elliptic or oblong-oblanceolate to oblong; capsule valves verrucose; habit spreading or straggling ..... 3. **tortuosum**

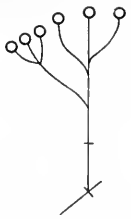
4(1) Leaves in whorls of 3, without dark glands; usually dense ± rounded shrub ..... 4. **ternatum**

Leaves paired, with inframarginal dark glands; straggling to prostrate shrublet ..... 5. **pallens**

1. **Hypericum fieriense** N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 68 (1993). Type: Socotra, Hagghiher Mountains (12°35'N, 54°03'E), below Fieri peaks, 1350 m, 21 April 1967, *Smith & Lavranos* 475 (K!-holotype & isotype).

Fig. 21E, Map 21.

Shrub c. 1 m tall, much branched, flat-topped, with branches ascending, dark glands absent. *Stems* fawn-puberulous, soon regularly



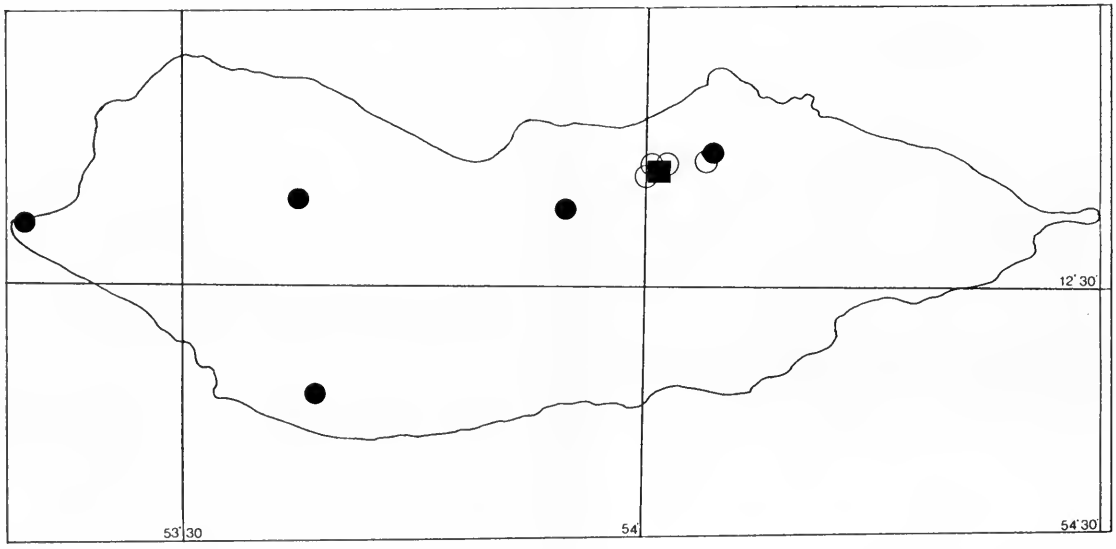
4-lined; cortex green?; bark finely ribbed-striate. *Leaves* opposite, the pairs initially united at base, petiolate, with petiole 4–6 mm long, densely to rather sparsely fawn-puberulous with scattered stellate hairs; lamina 10–17 × 7–12 mm, triangular-ovate to oblong-ovate, glabrous above, paler and densely fawn-puberulous beneath with scattered, often tufted villous hairs, midrib and laterals prominent beneath and ± impressed above, coriaceous; apex subobtuse to rounded, margin inrolled, base broadly cuneate to shortly angustate or truncate; venation: 4–5 pairs of laterals, closed or lower 1–2 pairs free, without or with 1–3 cross-veins distally; laminar glands dense, prominent on upper surface, intramarginal glands dense. *Inflorescence* 3–5-flowered, from 1–2 distant or ± close nodes, the inflorescence thus more or less subumbellate; pedicels 8–9 mm, bracts and bracteoles linear. *Flowers* 9–10 mm in diam.; buds narrowly ovoid, acute. *Sepals* in fruit recurved, 4–5 × *c.* 1.5 mm, linear-lanceolate, acute, margin entire, coriaceous; veins *c.* 7, slightly prominent; laminar glands linear, all pale. *Petals* incomplete in specimen seen. *Stamens c.* 60?, with filaments (in each fascicle) united above base. *Ovary* not seen. *Capsule* 6–7.5 × 4.5–6 mm, pyramidal-ovoid, truncate, with persistent divergent horn-like style bases, coriaceous, with valves finely longitudinally vittate, exceeding sepals. *Seeds* dark brown, *c.* 1.1 mm long (immature?); testa foveolate-reticulate.

'Low scrub among *Dracaena cinnabari* trees'; 1350 m.

Socotra (Hagghiher Mts).

SOCOTRA. Hagghiher Mts, 12°35'N, 54°03'E, below Fieri peaks, 1350 m, 21 April 1967 (fr), *Smith & Lavranos* 475 (K).

This strikingly distinct species is known from only the above collection. It is clearly related to the other Socotran low shrubs, *H. scopulorum* and *H. tortuosum*, but differs from them *inter alia* in leaf shape and inflorescence form and, particularly, in the presence of an



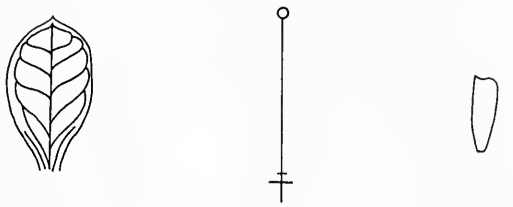
Map 21 Sect. 23: 1. *H. fieriense* ■; 2. *H. scopulorum* ○; 3. *H. tortuosum* ●.

indumentum on young vegetative parts and the lower surface of the leaves.

2. **Hypericum scopulorum** Balf. f. in *Proc. R. Soc. Edinb.* **11**: 502 (1882), in *Trans. R. Soc. Edinb.* **31**: 27, t. 4A (1888), in Forbes, *Nat. Hist. Socotra*: 456 (1903); Vierh. in *Denkschr. Akad. Wiss. Wien* **71**: 389 (1907); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925) ['*scopulosum*']; N. Robson in *Kew Bull.* **12**: 434, 444 (1958); Moggi & Pisacchi in *Webbia* **22**: 268, f. 10, carta 6 (1967). Type: Socotra, Passhöhe oberhalb Kischen, 1000 m, 6 May 1881, *Schweinfurth* 756 (E-lectotype, Moggi & Pisacchi, 1967); über Kischen, 900 m, 1 May 1881, *Schweinfurth* 622 (E, LE-syntypes); in montibus Haggier [Debra hi-hon], 900 m, February-March 1880 (fr), *I.B. Balfour* [with *Cockburn & Scott*] 405 (BM!, E-syntypes).

Fig. 21A, Map 21.

Icon: Moggi & Pisacchi in *Webbia* **22**: 270, f. 10 (1967).



Shrub 0.3–*c.* 1.3 m tall, much branched, flat-topped, with branches erect to ascending; wholly glabrous or (especially upper) pruinose to whitish-puberulous beneath; dark glands absent. *Stems* persistently 4(6)-lined; cortex reddish?; bark finely ribbed. *Leaves* opposite, free, sessile or rarely petiolate with petiole up to 2 mm long; lamina 10–27 × 6–12(–17) mm, elliptic to oblong, paler beneath, ± densely glaucous on both sides, coriaceous; apex subapiculate-obtuse to rounded, margin plane to subincrassate, base narrowly cuneate to subangustate; venation: 4–6 pairs of laterals, closed or lower 1–2 pairs free, without cross-veins; laminar glands ± dense, not or slightly prominent on both sides, intramarginal glands dense. *Inflorescence* 1(2)-flowered, terminal and from axils of older leaves of current shoot; bracts foliar, bracteoles lanceolate to linear-subulate, deciduous; pedicels 3–8 mm long, slender. *Flowers* 10–14 mm in diam.; buds narrowly ellipsoid, acute. *Sepals* 5–6.5 × 1–1.3 mm, free or very shortly connate, distally outcurving in fruit, ensiform, acute, coriaceous, margin entire; veins 7, slightly prominent; laminar glands punctiform. *Petals* golden yellow to orange yellow (old?), not tinged red, 6–7 × 2–3 mm, 1.1–1.2 × sepals, oblong-oblanceolate, rounded. *Stamens c.* 30, longest *c.* 3.5 mm, *c.* 0.5 × petals. *Ovary c.* 1.3 × 0.6 mm, narrowly ellipsoid, obtuse; styles 2–3.5 mm long, 2–3 × ovary, curved-ascending. *Capsule c.* 4 × 3.5 mm, broadly ellipsoid, obtuse, subcoriaceous (enclosed by old, distally twisted petals), with valves longitudinally vittate, shorter than sepals. *Seeds* dark brown, 1.3–1.6 mm long; testa foveolate-reticulate.

High-altitude thicket on rocky or grassy slopes; 775–1322 m.

Socotra (Hagghiher Mts).

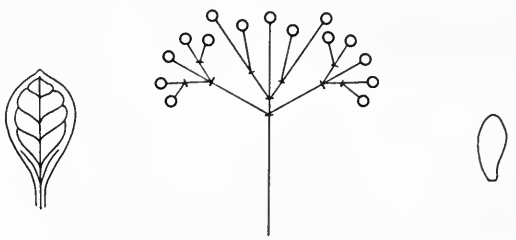
SOCOTRA. Adho Demalu, 900 m, 16 March 1953 (fl), *Popov* GP/SO/262 (BM, EA); Jebel Shihali, 20 April 1967 (fl & fr), *Smith & Lavranos* 446 (BM, K); Debra hi-hon, 900 m, 25 August 1956 (fl), *Gwynne* 138 (BM); Aduno pass, 775 m, 6 March 1989 (fl), *Miller* et al. M.8671 (E, K).

Of the three endemic Socotran Triadenioid species, *H. scopulorum* has the most primitive leaves (glabrous and mostly sessile); but it is less woody than *H. fierense*, and the inflorescence and fruit are more reduced. According to the label of *Smith & Lavranos* 446, it is associated with *Croton eleagnoides* Balf. f.

3. **Hypericum tortuosum** Balf. f. in *Proc. R. Soc. Edinb.* **11**: 502 (1882), in *Trans. R. Soc. Edinb.* **31**: 28, t. 4B (1888), in Forbes, *Nat. Hist. Socotra*: 457 (1903); Vierh. in *Denkschr. Akad. Wiss. Wien* **71**: 389 (1907); G.B. Popov in *J. Linn. Soc.* (Bot.) **55**: 714 (1957); N. Robson in *Kew Bull.* **12**: 434, 444 (1958); Moggi & Pisacchi in *Webbia* **22**: 269, f. 11, carta 6 (1967). Type: Socotra, Passhöhe über Kischen, 1000 m, 6 May 1881, *Schweinfurth* 757 (E-lectotype, Moggi & Pisacchi, 1967); no precise locality ['With the foregoing species (*H. scopulorum*) on the Haghier range at a high elevation' (600 m)], February-March 1880, *I.B. Balfour* [with *Cockburn & Scott*] 607 (E-syntype).

Fig. 21B, Map 21.

Icon: Moggi & Pisacchi in *Webbia* **22**: 271, f. 11 (1967).



Shrub or shrublet to *c.* 0.5 m tall, much branched, ± round-topped or trailing, with branches divergent-ascending, flexuous; wholly glabrous or with young stems and leaves beneath densely and minutely papillose; dark glands absent. *Stems* persistently 4-lined; cortex reddish; bark finely longitudinally ribbed. *Leaves* opposite, free, all sessile or lower petiolate, with petiole up to 4 mm long; lamina 8–17(–23) × 4–11(–15) mm, obovate or oblanceolate to elliptic-oblong or suborbicular, paler beneath, glaucous on both sides (densely so beneath), coriaceous; apex obtuse (or subacute?) to rounded, margin revolute, base cuneate; venation: 4–5(–8) pairs of laterals, closed, without cross-veins but sometimes with rather obscure tertiary reticulation; laminar glands dense, obscure, not prominent or slightly so beneath or on both sides; intramarginal glands rather dense, obscure. *Inflorescence* 7–*c.* 35-flowered, terminal, subumbellate, occasionally with single axillary flower from lower node; uppermost leaf pair modified as bracts, oblong, amplexicaul; bracteoles minute, basal; pedicels 4–8 mm long, slender. *Flowers c.* 10 mm in diam.; buds ellipsoid, obtuse. *Sepals* 4–6 × (1–)1.5–2.5 mm, free, imbricate, unequal, elliptic to oblong-oblanceolate or oblong, acute to rounded, thinly chartaceous, margin entire; veins 7(–11), prominent, pinnately branched; laminar glands absent. *Petals* bright yellow, not tinged red, 6–7 × 2–3 mm, 1.5–2 × sepals, elliptic to oblanceolate, rounded. *Stamens c.* 25, longest 4–7(–7) mm, *c.* 0.7 × petals. *Ovary* 1.5–2 × 1–1.7 mm, ovoid-ellipsoid, acute; styles 3–5 mm long, 2–2.5 × ovary, curved-ascending. *Capsule c.* 5 × 2.5 mm, ellipsoid, acute, subcoriaceous, with valves glandular-verrucose (vesiculate), about equalling sepals. *Seeds* dark brown, *c.* 1.2 mm long; testa rugulose.

Among rocks and crags (sometimes limestone) on hillsides; (33–)200–1200 m.

Socotra (Hagghiher Mts, Reighid, extreme west).

SOCOTRA. Reiged [Reighid], 750 m, 12 March 1953 (fl & e. fr), *Popov* GP/So/213 (BM, EA); Jebel Rhugid, 600 m, 8 February 1990 (fl), *Miller* et al. M.10340 (E, K*, UPS*); Shihali, *c.* 9 km SSE of Hadiboh, 1150 m, 6 March 1989 (fl & fr), *Miller* et al. M.8680 (E); Ras Shoalo, 33 m, 19 February 1953 (fl), *Popov* GP/So/143 (BM); 6 km E. of Ras Kattanahan, 200 m, 17 January 1994 (fl & e. fr), *Thulin & Gifri* 8579 (K, UPS); 16 km SE of Qalansiyeh, 700 m, 24 January 1994 (fl), *Thulin & Gifri* 8723 (K, UPS); no precise locality, 1897 (fl), *Mr & Mrs T. Bent* s.n. (K). Also recorded from Adho Dimellus in Forbes (1903) and by Vierhapper (1907) and from near the

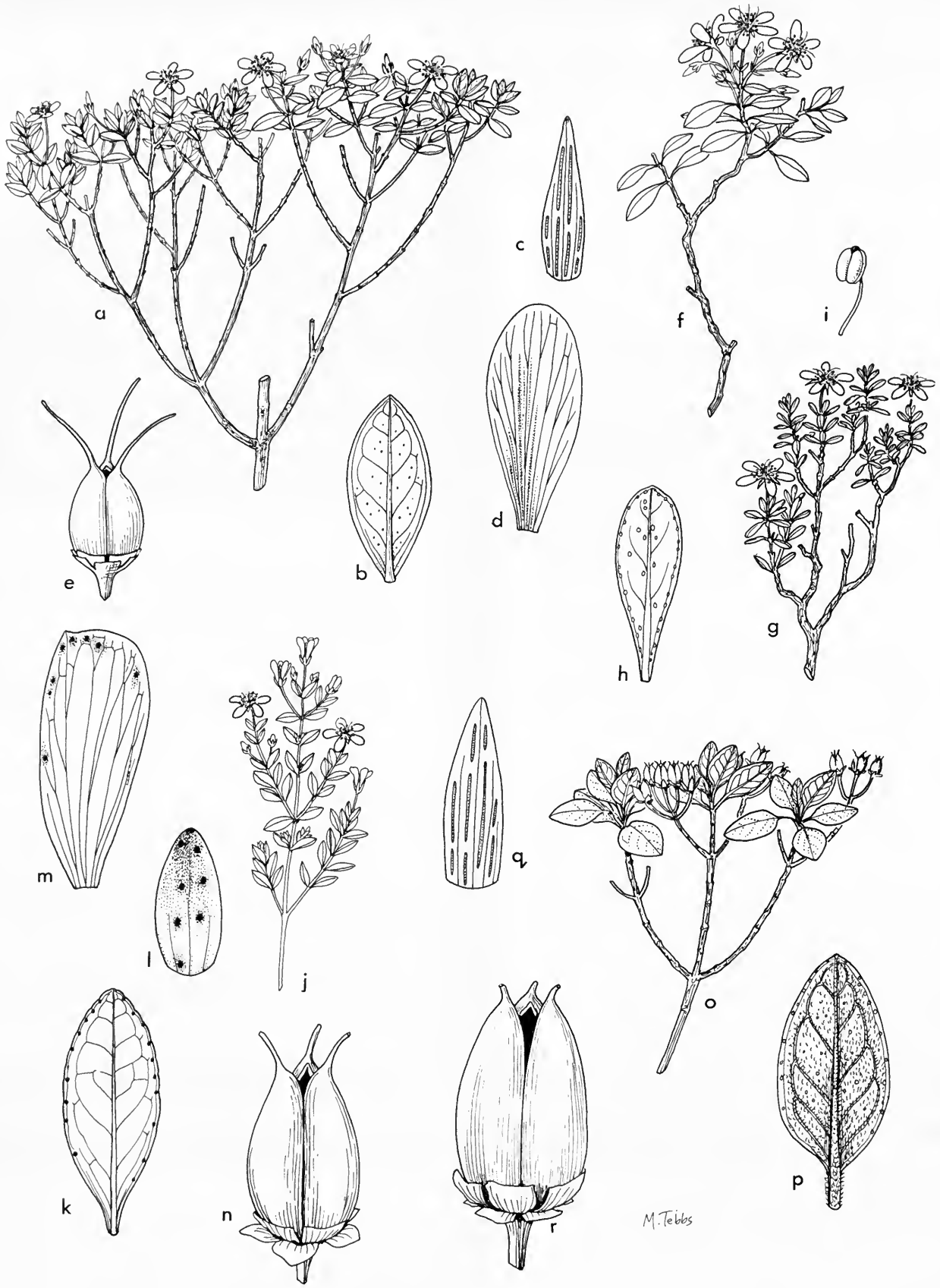


Fig. 21 A. *H. scopulorum*: (a) habit; (b) leaf: (c) sepal; (d) petal; (e) capsule. B. *H. tortuosum*: (f) habit. C. *H. ternatum*: (g) habit; (h) leaf; (i) anther. D. *H. pallens*: (j) habit; (k) leaf; (l) sepal; (m) petal; (n) capsule. E. *H. fieriense*: (o) habit; (p) leaf; (q) sepal; (r) capsule (a, f, g, j, o, × ½; b, p × 2; h, k, × 3; c-e, l-n, q, r × 5; i × 10). A. *Smith & Lavranos* 446. B. *Popov* 213. C. *Davis* 15514. D. *Davis & Polunin* 25968. E. *Smith & Lavranos* 475.

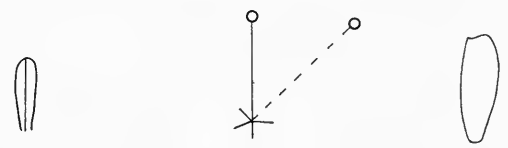
summit of Jebel Serai (1322 m) and Adho Pass (877 m) by Simony, 18 February 1899 (*fide* Vierhapper, 1907).

H. tortuosum is apomorphic relative to the other two Socotran species of sect. *Triadenioides* in its less woody, spreading to pendulous habit, smaller size, larger sepals and verrucose capsules; and its subumbellate inflorescence and usually petiolate leaves are also specialized relative to *H. scopulorum*. The population originally described (from the central mountains) has leaves (except the bracts) all, or at least the lower, petiolate with 4–5 lateral veins and no visible tertiary reticulate venation, and the young stems and lower leaf surface are smooth to undulate; whereas the western lowland population has wholly sessile, larger leaves and sometimes larger flowers, the leaves may have up to 8 pairs of lateral veins and obscurely visible tertiary reticulate venation, and the young stem and the leaves beneath are sometimes minutely papillose.

The western population therefore approaches *H. scopulorum* in several characters; but in others (e.g. the prostrate habit) it is typical of *H. tortuosum*. It would seem, then, to be the remains of the stock from which the above two species diverged, an interpretation that is supported by the presence in some leaves of more numerous lateral veins than is usual in either species, thus showing a tendency towards *H. socotranum* (sect. 1. *Campylosporus*). These characters of the western population do not, however, provide a clear-cut separation of the two populations, e.g. the lower leaves of the central mountain population may be shortly petiolate (*Miller* et al. M.8680), or leaves at several upper nodes may be wholly sessile (Balfour, 1888: t. 4B). I therefore hesitate to treat these populations as separate taxa, preferring to regard them as geographically distinct, respectively plesiomorphic and apomorphic parts of an almost continuous morphocline.

4. **Hypericum ternatum** Poulter in *Notes R. bot. Gdn Edinb.* **21**: 181 (1954); N. Robson in P. Davis, *Fl. Turkey* **2**: 368, f. 11/6 (1967); Greuter, Burdet & Long, *Med-Checklist* **3**: 273 (1986); I. Hagemann in *Flora* **183**: 288, ff. 60–63 (1989). Type: Turkey, Antalya, distr. Gebiz, Bozburun Dağ near Tozlu Çukur yaylâ, 24 July 1949 (fl), *Davis & Bilger* D.15580 (K!-holotype; E!-isotype). Fig. 21C, Map 23.

Icon: I. Hagemann in *Flora* **183**: 288, f. 60 (1989).



Shrublet 0.08–0.15(–0.27) m tall, much branched, strongly lignified, ± round-topped to irregularly hemispherical, with branches erect to divergent-ascending or prostrate (typical dwarf espalier shrub – Hagemann, 1989: 288); wholly glabrous, red or black glands sometimes present in flowers. *Stems* 3-angled (6-lined) at first, eventually ± terete; cortex green; bark smooth, cinnamon-brown. *Leaves* all 3-whorled or uppermost paired, free, petiolate, with petiole 0.4–1 mm long; lamina (2–)3–8(–10) × 1.2–2.4 mm, oblanceolate to elliptic, concolorous, glaucous, subcoriaceous: apex rounded, margin recurved-subindurate, base narrowly cuneate; venation: 1 pair of laterals sometimes discernible; laminar glands dense to sparse, scarcely prominent; intramarginal glands dense. *Inflorescence* 1(–3)-flowered, terminal and in uppermost leaf axils; bracteoles 1–2.5 mm long, linear, submembranous; pedicels 3–11 mm long, slender. *Flowers c.* 15 mm in diam.; buds ovoid-pyramidal, subacute. *Sepals* green or pink-tinged, (2–)3–4(–5) × 0.75–2 mm, free, not imbricate, equal, lanceolate to linear, acute chartaceous, margin entire to subentire or minutely denticulate; veins 3(5), not prominent or branched; laminar glands pale, punctiform, sparse; marginal or intramarginal glands 1–*c.* 16, black or reddish, or none. *Petals* yellow, sometimes veined red, 7–10(–12?) × 2–3 mm, *c.* 3 × sepals, elliptic to oblong, rounded, eglandular or with indistinct pale dots toward apex. *Stamens c.* 10, longest 6–8 mm, *c.* 0.8 × petals; anther gland (always?) black. *Ovary* 2–2.5 × 1–1.5 mm, narrowly ovoid-ellipsoid, acute; styles *c.* 3 mm long, 1.5 × ovary, curved-ascending. *Capsule* 5–6 × 3–3.5 mm, ovoid-conic, narrowly acute, subcoriaceous, with valves longitudinally vittate, exceeding sepals. *Seeds* blackish, *c.* 1.7 mm long, narrowly carinate; testa linear-foveolate.

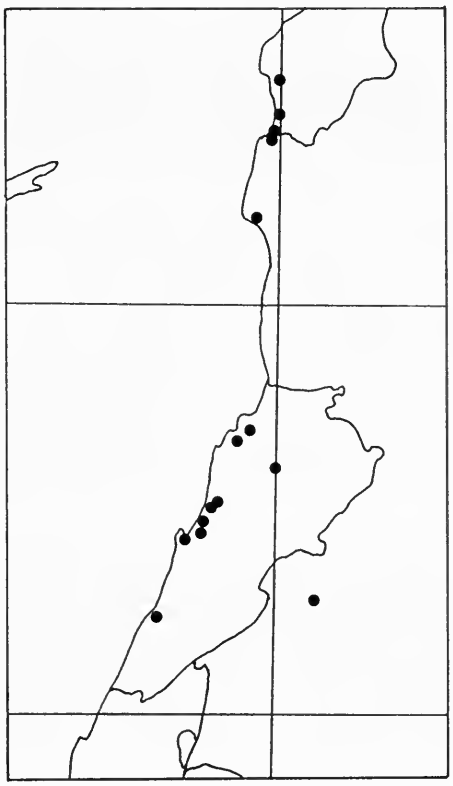
In fissures of limestone or conglomerate rocks and cliffs, usually in the *Cedrus* or *Pinus* woodland belt; sea level and 1600–1900 m.

Turkey (Pisidian Taurus, Pamphylia).

TURKEY. Antalya: distr. Antalya, Insel Granbusa (Sula Ada), 0 m, 30 May 1950 (fl), *Huber-Morath* 13825 (BASBG); distr. Finike, Aykirka, 1950, *Heilbronn & Atilla* s.n. (ANK n.v.); distr. Gebiz, Bozburun Dağ between Bogaz Azzi and Tozlu Çukur yaylâ, 1600 m, 24 July 1949 (fl), *Davis* 15514 (E, K). Isparta: distr. Sütçüler, W. side of Sarp Dağ, 1700 m, 29 July 1949, *Davis & Bilger* D.15781 (E, K).

H. ternatum is a morphological link between the Socotran species and *H. pallens*, although the apparently constantly 3-whorled arrangement of the leaves differentiates it from both. It is known as yet only from (i) two adjacent mountains on the border of vilayets Antalya and Isparta (Bozburun dağand Sarp dağ) and (ii) a small island off the coast and another, mainland, locality, both near Finike, south of Tahtali dağ. It seems idle to speculate on the significance of this bitopic distribution, at least until more data are available.

5. **Hypericum pallens** Banks & Solander in Russell, *Aleppo* 2nd ed. **2**: 270 (1784); Eig in *J. Bot. Lond.* **75**: 188 (1937); Poulter in



Map 22 Sect. 23: 5. *H. pallens* (part) all records ●.

Notes R. bot. Gdn Edinb. **21**: 181 (1954); N. Robson in P. Davis, *Fl. Turkey* **2**: 369, f. 11/7 (1967), **10**: 361 (1988); Mouterde, *Nouv. Fl. Liban Syrie* **2**: 521, t. 225 f. 2 (1986); I. Hagemann in *Flora* **183**: 284, ff. 58, 59, 62, 63 (1989); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 70 (1995). Type: Turkey/Syria, montes inter Aleppo et Antiocham, 1771 (fl), *P. Russell* (BM!-holotype).

Fig. 21D, Maps 22, 23.

H. cuneatum Poir., *Encycl.*, Suppl. **3**: 699 (1814); Choisy, *Prodr. Monogr. Hypéric.*: 50 (1821), in DC., *Prodr.* **1**: 549 (1824); Spach in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836); Jaubert & Spach, *Ill. pl. orient.* **1**: 49, t. 25 (1842); Boiss., *Fl. orient.* **1**: 794 (1867), Suppl.: 127 (1888); Post, *Fl. Syria*: 171 (1896), op. cit., 2nd ed. **1**: 230 (1932); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925); Boul., *Fl. Liban*: 68, t. 74 f. 4 (1930); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: t. 3 f. 17 (1932), **11**: 152 (1933), **12**: 83 (1934), in *Pflanzenareale* IV, **1**: Karte 2b (1933); Ashberry, *Min. trees & shrubs*: 133 & photograph (1958); Rech. f. in *Ark. Bot.* **5**: 291 (1960); Ingwersen, *Man. Alpine pls*: 209 (1978). Type: Syria, prope Nourieh, *de Labillardière* s.n. (FI-holotype).

H. myrtilloides Fenzl, *Pug. pl. nov. Syr.*: 7 (1842). Type: Turkey [Hatay], prope Svedie [Souedieh], *Kotschy* 108 (W-holotype; K!).

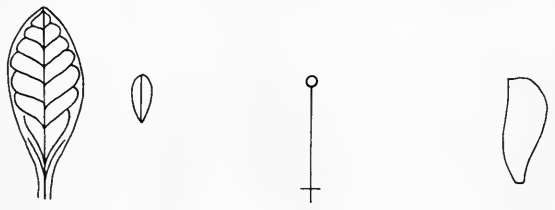
H. tenellum Kotschy ex Boiss., *Fl. orient.* **1**: 794 (1867), in synon.

H. cuneatum [var.] b. *fragile* Post, *Fl. Syria*: 171 (1896). Type: Lebanon, Jabal Fughri, *Post* s.n. (BEI-holotype).

H. cuneatum [var.] c. *pallidum* Post, *Fl. Syria*: 171 (1896). Type: Lebanon, Nahr-ul-Kalb, *Post* s.n. (BEI-holotype).

H. cuneatum var. *maximum* Post, *Fl. Syria* 2nd ed. **1**: 232 (1932), nomen.

Icon: Jaub. & Spach, *Ill. pl. orient.* **1**: 49, t. 25 (1842).



Shrublet 0.05–0.25(0.4) m long, much branched, wiry to lignified, with branches slender, ascending to prostrate, diffuse; wholly glabrous; red or black glands present in leaves, flowers and sometimes stems. *Stems* 4-lined and ancipitous at first, eventually terete; cortex becoming bright red, sometimes with a few black glands; bark striate, reddish brown. *Leaves* paired, free, petiolate, with petiole *c.* 0.5–1 mm long; lamina (2.5–)4–14(–22) × (1–)2.5–7.5(–9) mm, oblong or elliptic (or rarely ovate) to obovate or oblanceolate, concolorous, glaucous beneath or on both sides, (sub?)coriaceous; apex rounded, margin plane to subrecurved, base cuneate to long-angustate or pseudopetiolate; venation: 0–2(–6) pairs of laterals, with tertiary reticulation visible in larger leaves; laminar glands sparse or absent, occasionally black; submarginal glands scattered, black; intramarginal glands dense. *Inflorescence* 1(2–3)-flowered, terminal and often also 1-flowered axillary or terminating branches from up to *c.* 6 axils below, sometimes with up to 4 flowering branches from scattered lower nodes, the whole appearing racemiform; bracteoles narrowly oblong or absent; pedicels 5–9 mm long, slender, 'erect or resupinate'. *Flowers* 10–13(–15) mm in diam.; buds cylindric-ellipsoid, rounded, bright sealing-wax red (at least in prostrate form). *Sepals* green or pinkish red, (2–)3–5(–6) × 0.7–2.5 mm, free or almost so, not or slightly imbricate, equal, lanceolate or narrowly oblong or ± narrowly elliptic to linear, acute to rounded, chartaceous to submembranous, margin entire or irregularly glandular-denticulate; veins (3)5–7, not or only midrib prominent, often ± branched; laminar glands pale, punctiform or elongate, dense to sparse, often also 1–5 black, scattered; inframarginal glands pale, dense to sparse; marginal black glandular teeth 0–*c.* 10, elongate. *Petals* bright yellow, tinged bright red outside in bud, 6–12 × 2.5–4.5 mm, 2–2.5 × sepals, elliptic to oblong, obtuse with apiculus acute, lateral, with laminar glands scattered, punctiform or rarely striiform or linear, pale or sometimes some towards apex black or reddish. *Stamens* 20–30, longest 6–8 mm, 0.75–0.8 × petals; anther gland black. *Ovary* 2 × 1.5 mm, ovoid-ellipsoid to ellipsoid, acute to acuminate; styles 3–4 mm long, *c.* 2.5 × ovary, divergent. *Capsule* 4–5 × 3–4 mm, ovoid, subcoriaceous, surrounded by old petals, with valves longitudinally vittate, shorter than sepals. *Seeds* reddish brown, *c.* 1 mm long, ecarinate; testa linear-foveolate. 2n = 16 (Reynaud, 1973).

In fissures of hard limestone rocks; 50–1700 m.

Turkey (eastern Cilicia, Amanus), Syria (Latakia), Lebanon (north-west coastal plain and Lebanon range).

TURKEY. Konya: distr. Ermenek, Hamitseydi boğar, between Sarawadi and Beskuyu rocks, 1500–1700 m, 16 August 1949 (fl), *Davis* 16232 (E, K). Içel: distr. Mut?, *c.* 9 km W. Abzweigung Silifke – Gülnar, 150 m, 4 July 1977 (st), *Sorger* 77–21–7 (W); distr. Anamur, Anamur – Gilindire, 50 m, 1956 (fl), *Davis & Polunin* D.25968 (BM, E, K); Cilicia, Gysel Dere, 300 m, May 1896 (fl), *Siehe* 200 (BM, E, JE, K, S); distr. Mersin, Mersin – Kuzucubelen, 1 km from Kuzukubelen, 600 m, 18 June 1950 (fl), *Huber-Morath* 9539 (BASBG). Seyhan: 20 km NW Kadirli, 250 m, 31 May 1973 (fl), *Sorger* 73–10–11 (BM). Hatay: 4 hrs S. of Antioch [Antakya], 11 June 1884, *Post* s.n. (BM, BEI*); Amanus, infra pag. Bityas, *c.* 200 m, 25 May 1933 (fl), *Samuelsson* 5418 (S).

SYRIA. Recorded from Latakia (coast), the base of Mt Cassius [Jebel Akra] (Turkish border) and W. of Sarmada, Sourate (inland), *fide* Mouterde (1970: 522).

LEBANON. Nahr el Kelb, 15 May 1942 (fl), *Davis* 6102 (BM, K); Djier el Madfour (inter Batroun [Batrūn] et Tripoli), 8 June 1932 (fl), *Samuelsson* 2209 (S); in rupibus regionis ad Brummana, 600–700 m, 7 July 1897 (fl), *Bornmüller* 238 (BM, E, G, JE, K).

H. pallens is less woody and more procumbent to prostrate in habit than *H. ternatum*, and its area of distribution lies wholly to the east of that of the latter. The petals are red-tinged and the leaves (always paired) more variable – usually similar but sometimes broader or much larger ('var. *maximum*', from '4 hours south of Antioch', 11 June 1884, *Post*), but none of this variation warrants subdivision of the species. The inflorescence, although often racemiform, consists of 1(rarely 2–3)-flowered sylleptic branches and thus, as Hagemann (1989: 285) has pointed out, is essentially similar to the 1-flowered synflorescence of e.g. *H. revolutum* (sect. 1. *Campylosporus*).

Sect. 24. **HETEROPHYLLA** N. Robson in *Notes R. bot. Gdn Edinb.* **27**: 185 (1967) ['*Heterophyllum*'].

Shrublet, erect, up to 0.25 m tall, semi-deciduous, glabrous, without dark glands; branching effectively pseudo-dichotomous. *Stems* 2-lined to terete, glandular; cortex green; bark smooth, reddish brown. *Leaves* opposite, decussate, sessile, free, deciduous at basal articulation, differing in form in lower (perennating) and upper (deciduous) parts of stem; lamina entire, with venation pinnate and open or 1-nerved, without tertiary reticulation; laminar glands linear to punctiform; marginal gland dots dense; ventral glands absent. *Inflorescence* 3–12-flowered, with branches dichasial, from 1–3 nodes, sometimes with lower flowering branches; bracts and bracteoles ± reduced. *Flowers* stellate, homostylous. *Sepals* 5, free, persistent, erect in fruit, with margin entire; laminar glands linear to striiform; marginal, submarginal and inframarginal glands absent. *Petals* 5,

persistent, erect but not twisting after flowering, with apiculus subterminal or obsolete; margin entire; marginal glands absent; laminar glands linear. *Stamen fascicles* 3 (i.e. united 2+2+1), distinct, persistent, with stamens 35–45; filaments basally united; anthers yellow, gland amber; pollen type X. *Ovary* with 3 subaxile placentae, each 2-ovulate; styles 3, free, bases contiguous; stigmas small. *Capsule* 3-valved, chartaceous, with valves longitudinally vittate. *Seeds* not seen mature, carinate; testa foveolate.

BASIC CHROMOSOME NUMBER (X). 9; ploidy 2.

HABITAT. Clearings in *Pinus nigra* woodland, on limestone; 1200–2000 m.

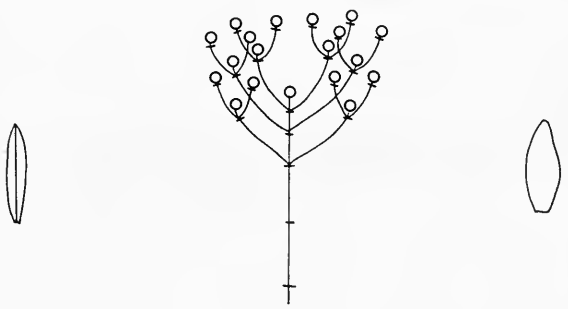
DISTRIBUTION. Turkey (north-west and west-central Anatolia).

1 species.

1. **Hypericum heterophyllum** Vent., *Descr. pl. nouv.*: t. 68 (1800); Choisy, *Prodr. Monogr. Hypéric.*: 49 (1821), in DC., *Prodr.* **1**: 549 (1824); Spach in *Annls Sci. nat.* (Bot.) **5**: 357 (1836); Boiss., *Fl. orient.* **1**: 793 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925); Stefanoff in *Kew Bull.* **1931**: 30 (1931), in *God. Agr.-les. Fak. Univ. Sofiya* **10**: t. 2 f. 8 (1932), **11**: 145 (1933), **12**: 82 (1934), in *Pflanzenareale* IV, **1**: Karte 2a (1933); N. Robson in P. Davis, *Fl. Turkey* **2**: 369 (1967), **10**: 361 (1988); I. Hagemann in *Flora* **183**: 252, 294, ff. 23–28 (1989). Type: cult. in nursery of J.M. Cels, near Paris, *c.* 1800 (fl), ex 'Persia'; 'trouvé en Perse par Bruguière et Olivier et introduit chez Cels en l'an 6' (i.e. 1797–1798). Neither Boissier (1867) nor Stefanoff (1931–1934) seems to have doubted Ventenat's attribution of this species to the Iranian flora, despite the absence of subsequent collections from that country. Stefanoff (1931) drew attention to the collection by Whittall (K) labelled 'Smyrna', but correctly treated this locality as Whittall's address. Later (1933*a*: 145, 1933*b*), he accepted the Smyrna label for want of a more accurate locality. More recent collections have revealed the real native region of *H. heterophyllum* to be north-western and west-central Turkey, from Balikesir and Afyon to Ankara and Çankiri, a region traversed by Olivier and Bruguière on their journey to and from Iran in 1797–98.

Fig. 22B, Map 23.

Icones: I. Hagemann in *Flora* **183**: 253, f. 24 (1989); Vent., *Descr. pl. nouv.*: t. 68 (1800).



Shrublet (0.05)0.1–0.2(0.3) m tall, much branched to form flattish-topped bush, with basal lignified parts branched effectively pseudo-dichotomously, with branches erect and straight to decumbent and ± twisted; wholly glabrous, without dark glands. *Stems* 2-lined at first with short internodes and bearing small scale-like leaves, later 2-lined to terete with elongate internodes, the latter (inflorescence-bearing) part obscurely glandular and withering and leaving the over-wintering basal part bearing pairs of strobiliform condensed shoots; cortex green; bark smooth, reddish brown to greyish brown. *Leaves* free, sessile; perennating scale-leaves 0.5–1.5 mm long, broadly ovate or orbicular to obovate, cucullate, obtuse, apiculate to muticous, (all?) elongating in spring to spathulate, glaucous above, soon deciduous; foliage leaves 5–15 × 1–2 mm, narrowly elliptic-oblong to linear, concolorous, thinly glaucous above at least when young, coriaceous, apex acute, margin plane, base cuneate. *Inflorescence* (1–)3–5-flowered, terminal and often with single flowers or 3–5-flowered cymules in axils of 1–2 lower nodes, the whole up to 13-flowered, rounded-pyramidal to subcorymbiform; bracteoles triangular-lanceolate to linear; pedicels very short or absent. *Flowers* 8–12 mm in diam.; buds ellipsoid, subacute. *Sepals* green, 2–3.5 × 0.8–1.2 mm, imbricate, unequal, oblong to ovate-lanceolate, acute to subacute, entire; veins 5(3), not or only midrib prominent, unbranched; laminar glands linear to striiform. *Petals* bright yellow, not tinged red, 5–8 × 2.5–3 mm, 2.2–2.5 × sepals, obovate to oblanceolate, obtuse to rounded with apiculus small, subterminal or obsolete, with laminar glands linear. *Stamens* 35–45, longest 4.5–7 mm, *c.* 0.9 × petals. *Ovary c.* 1.5 × 0.7 mm, cylindric-ellipsoid to narrowly ovoid-cylindric, truncate; styles *c.* 4 mm long, *c.* 2.4 × ovary, widely spreading. *Capsule* 6–8 × 3–3.5 mm, ovoid-cylindric to narrowly cylindric, chartaceous, surrounded by old petals, longer than sepals, with valves longitudinally vittate. *Seeds* 2 on each placenta, not seen mature, rather prominently carinate; testa foveolate. 2n = 18 (Reynaud, 1973).

Dry clearings in *Pinus nigra* subsp. *pallasiana* (Lamb.) Holmboe woodland and in garigue with *Cistus laurifolius* L.; 1200–2000 m.

Turkey (north-west and west-central Anatolia).

TURKEY. Balikesir: Dorsunbey, Alaçam Intifa, 1200 m, 17 July 1951 (fl), *Güresin* s.n. (ISTO). Bolü: Passhöhe sudlich von Gerede, 1600 m, 8 August 1963 (fl), *Huber* s.n. (BM, WB). Çankiri: NW of Kizilchamam, 1520 m, 5 September 1966 (fl & fr), *Archibald* 3316 (E, K). Ankara: Ankara – Istanbul road opposite turning to Çamçoru, near Kizilcahamam, 19 August 1970 (fl), *Fraser-Jenkins* 2091 (BM); Ankara – Bolü, 34 km sudöstlich Gerede, *c.* 1600 m, 8 June 1962 (e. fl), *Sorger* T62/62/20 (E). Afyon: à 20 km à l'est d'Afyon[6], 1970 (fl), *Contandriopoulos & Quezel* 70–534 (MARS).

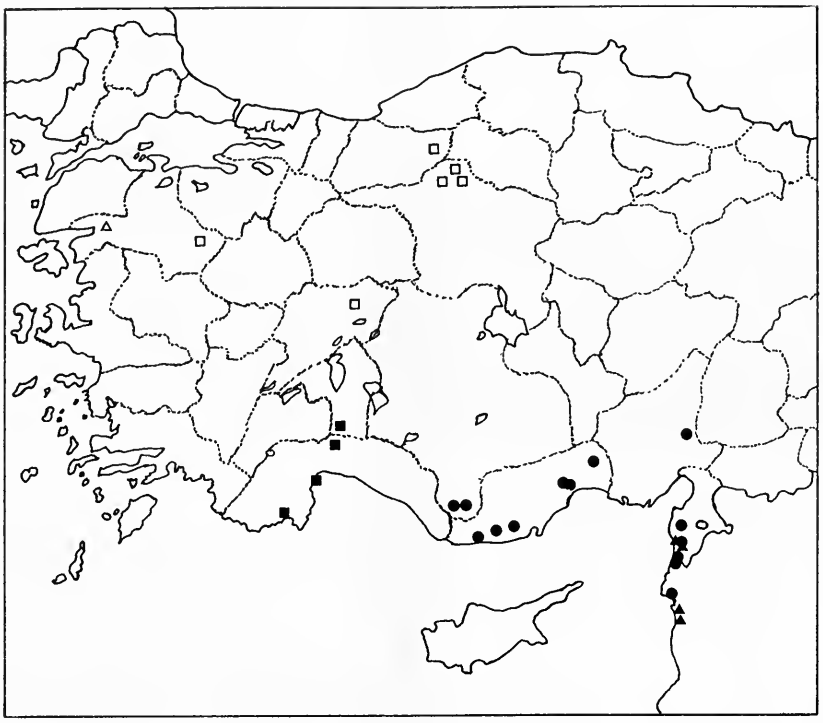
H. heterophyllum is systematically isolated in *Hypericum*. It seems to share with *H. aegypticum* (sect. 25) an origin near *H. balfourii* or *H. socotranum* (sect. 1) but to be neither wholly apomorphic nor wholly plesiomorphic in relation to it. It lacks the specializations that, in *Hypericum*, are unique to sect. 25 *Adenotrias*, viz. the heterostyly syndrome and the carunculate seeds; but it is more specialized than *H. aegypticum* in habit, in its biovulate placentae and in its chromosome number (2n = 18, whereas *H. aegypticum* and *H. russeggeri*, both sect. 25, have 2n = 20).

A detailed account of the growth form and behaviour of *H. heterophyllum*, both in nature and in cultivation, has been given by Hagemann (1989). For its relationship with *H. aegypticum* see p. 84.

Sect. 25. **ADENOTRIAS** (Jaub. & Spach) R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 209 (1893).

Shrubs and shrublets, erect to prostrate, up to 2 m tall, glabrous, without dark glands; branching lateral. *Stems* 4- to 2-lined, glandular; cortex green, bark smooth, grey-brown to pale grey. *Leaves* opposite, decussate, sessile, free, deciduous at basal articulation, homomorphic; lamina entire, with venation pinnate and open or 1-nerved, without tertiary reticulation; laminar glands punctiform;

[6] Mme Reynaud has kindly informed me that the locality in Konya cited by her (Reynaud, 1973: 210) is erroneous. She did, however, allude to the correct locality in the same paper (p. 203).



Map 23 Sect. 23: 4. *H. ternatum* ■; 5. *H. pallens* (part) ●. Sect. 24: 1. *H. heterophyllum* □. Sect. 25: 3. *H. russeggeri* ▲, extinct? Δ (see also Map 24).

marginal glands dense to rather sparse; ventral glands absent. *Inflorescence* 1–8-flowered, with branches dichasial, from terminal node only or also from lower nodes, sometimes with a 'sterile' intermediate zone; bracts and bracteoles reduced. *Flowers* hypocrateriform to almost tubular, heterostylous. *Sepals* 5, free, persistent, erect in fruit, with margin entire; veins 5–9; laminar glands linear; submarginal glands present; marginal and inframarginal glands absent. *Petals* 5, persistent, erect and apically twisting or deciduous after flowering, the apiculus absent, with basal entire ligulate appendage; margin entire; marginal and laminar glands absent. *Stamen fascicles* 3 (i.e. united 2+2+1), dimorphic, distinct, with stamens 9–*c.* 48 (3–20 per fascicle); filaments united to above middle; anthers yellow, gland amber; pollen type V. *Fasciclodes* 3, subglobose, alternating with fascicles. *Ovary* with 3 axile placentae, each ∞- or 2-ovulate; styles 3, dimorphic, bases contiguous; stigmas rather narrowly capitate. *Capsule* 3-valved, subcoriaceous, with valves finely longitudinally vittate. *Seeds* cylindric, ecarinate, with distal caruncle; testa finely linear-rugulose or linear-foveolate to linear-scalariform.

BASIC CHROMOSOME NUMBER (X). 10; ploidy 2.

HABITAT. Limestone rocks, often coastal; 0–1000 m.

DISTRIBUTION. South Morocco, Algeria (southern Atlas Mts), Lampedusa, Malta, Sardinia, Libya (Cyrenaica), Greece (Ionian Islands, Peloponnisos), Crete, Turkey (Amanus), Syria.

3 species (+ 2 subspecies).

Key to sect. 25. *Adenotrias*

1 Inflorescence 1-flowered, sessile; petals and stamens persistent; ovules numerous in each loculus; leaves elliptic to oblong (1. **aegypticum**) 2

Inflorescence (1)2–9-flowered, pedunculate; petals and usually stamens deciduous; ovules 2 in each loculus; leaves narrowly oblanceolate to linear 4

2(1) Leaves narrowly elliptic or narrowly oblong-elliptic, (7–)9–18 mm long, sessile; plant erect, (0.15–)0.3–2 m tall ..... 1a. **aegypticum** subsp. **maroccanum**

Leaves broadly elliptic or narrowly oblong, 3–10 mm long, subsessile to shortly petiolate; plant erect to spreading, 0.05–0.6 m tall 3

3(2) Leaves subsessile or to *c.* 0.3 mm petiolate, plane or subcucullate, 4–10 mm long; plant erect or loosely spreading, 0.04–0.6 m tall ..... 1b. **aegypticum** subsp. **webbii**

Leaves 1–2 mm petiolate, ± incurved-cucullate, 3–6 mm long; plant spreading, 0.15–0.18 m tall .. 1c. **aegypticum** subsp. **aegypticum**

4(1) Peduncle 10–20 mm long; leaves 1.5–3 mm wide; inflorescence 3–9-flowered; plant 0.1–0.3 m tall, erect to prostrate .. 2. **russeggeri**

Peduncle *c.* 2 mm long; leaves 0.6–1.4 mm wide; inflorescence (1)2–3-flowered; plant *c.* 0.05–0.06 m tall, prostrate ..... 3. **aciferum**

1. **Hypericum aegypticum** L., *Sp. pl.*: 784 (1753), op. cit., 2nd ed.: 1103 (1763), *Hypericum*: 6, f. 3 (1776), *Amoen. acad.* **8**: 323, t. 8 f. 3 (1785) ['*aegyptiacum*']; Murray, *Syst. veg.* 13th ed.: 583 (1774) ['*aegyptium*']; Lam., *Encycl.* **4**: 162 (1797); Willd., *Sp. pl.* **3**: 1467 (1802); Ker in *Bot. Reg.* **3**: t. 196 (1817); Choisy, *Prodr. monogr. Hypéric.*: 49 (1821), in DC., *Prodr.* **1**: 549 (1824); Spreng., *Syst. veg.* **3**: 334 (1826) ['*aegyptiacum*']; Margot & Reuter, *Essai Fl. Île Zante*: 35 (1838) ['*aegyptiacum*']; Chaub. & Bory, *Nouv. fl. Pélop.*: 53 (1838); Trevir., *Hyper. sp. animadv.*: 9 (1861); Nyman, *Syll. fl. Eur.* Suppl.: 222 (1865); Hook. f. in *Curtis's bot. Mag.* **106**: t. 6481 (1880); Fiori & Paol., *Fl. Italia* **1**: 385 (1898), *Iconogr. fl. ital. Ill.*: 143, f. 1247 (1899); Fiori, *Nuov. Fl. Italia* **1**: 519 (1924) ['*aegyptiacum*']; Borg, *Descr. fl. Maltese*

isl.: 247 (1927); Braun-Blanquet & Maire in *Bull. Soc. Hist. nat. Afr. N.* **22**: 107 (1931) ['*aegyptiacum*']; Jah. & Maire, *Cat. Pl. Maroc* **2**: 482 (1932) ['*aegyptiacum*']; Quézel & Santa, *Nouv. Fl. Algérie* **2**: 482 (1963); Arrig. in *Webbia* **20**: 324 (1965) ['*aegyptiacum*']; N. Robson in Tutin et al., *Fl. Europaea* **2**: 264 (1968); Bean, *Trees & shrubs hardy in Br. Isles* 8th ed. **2**: 407 (1973); Ornduff in *Bot. J. Linn. Soc.* **71**: 51 (1975), in *Heredity* **42**: 271 (1979); Ali in Ali & Jafri, *Fl. Libya* **2**: 4, f. 3 (1976); Haslam, Sell & Wolseley, *Fl. Maltese Is.*: 199 (1977); I. Hagemann in *Bot. Jb.* **102**: 247 (1981); Pignatti, *Fl. Italia* **1**: 345 (1982); Greuter in *Willdenowia* **14**: 279 (1984); Reynaud in *Adansonia* **7**B: 90, tt. 1, 2 ff. 5, 6 (1985); Greuter, Burdet & Long, *Med-Checklist* **3**: 263 (1986); Turland in *Q. alp. Gdn Soc.* **58**: 311, 318 & photograph (1990); Turland, Chilton & Press, *Fl. Cretan area*: 93, map 673 (1993); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 70, ff. 11.2, 11.7, 11.12 (1995). Type: [Libya?] 'Habitat in Aegypto, *D. B. Jussiaeus*' in Herb. Juss. 11803 (P-JUS!-lectotype, selected here). This species occurs in Libya (Cyrenaica) but not Egypt. The specimen in Paris seems to be the only possible type material known – there is nothing relevant among Linnaeus's correspondence with Bernard de Jussieu at the Linnean Society. An examination of the microfiche shows that this specimen would appear to be from the Libyan population; and, as it is said to come from Egypt, I have designated it as the lectotype.

Fig. 22A (subsp. *maroccanum*), Map 24.

H. creticum Hort. ex Link, *Enum. hort. berol. alt.* **2**: 276 (1822), in synon.

Elodea aegyptica (L.) Jack, *Mal. Misc.* **2**(7): 25 (1822) ['*Egyptiaca*'], in *Calcutta J. nat. Hist.* **4**: 211 (1844).

Triadenia microphylla Spach in *Annls Sci. nat.* (Bot.) II, **5**: 173, t. 4 (1836), *Hist nat. vég.* Phan. **5**: 371 (1836), op. cit. Atlas: t. 119 f. 1 (1846). Type as for *Hypericum aegypticum*.

Episiphis parvifolia Raf., *Fl. Tellur.* **3**: 78 (1837). Type as for *Hypericum aegypticum*.

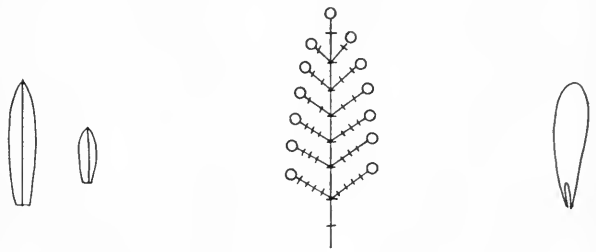
Triadenia aegyptica (L.) Boiss., *Fl. orient.* **1**: 783 (1867), Suppl.: 125 (1888) ['*aegyptiaca*']; Batt. & Trabut, *Fl. Algérie Tunisie*: 76 (1904); Pamp., *Prodr. fl. ciren.*: 320 (1930).

Hypericum heterostylum Parl., *Fl. Ital.* **5**: 550 (1875); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 175, f. 73A–E (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: t. 2 f. 3 (1932), **11**: 140 (1933), **12**: 81 (1934), in *Pflanzenareale* **4**(1): Karte 1a (1933). Type as for *H. aegypticum* L.

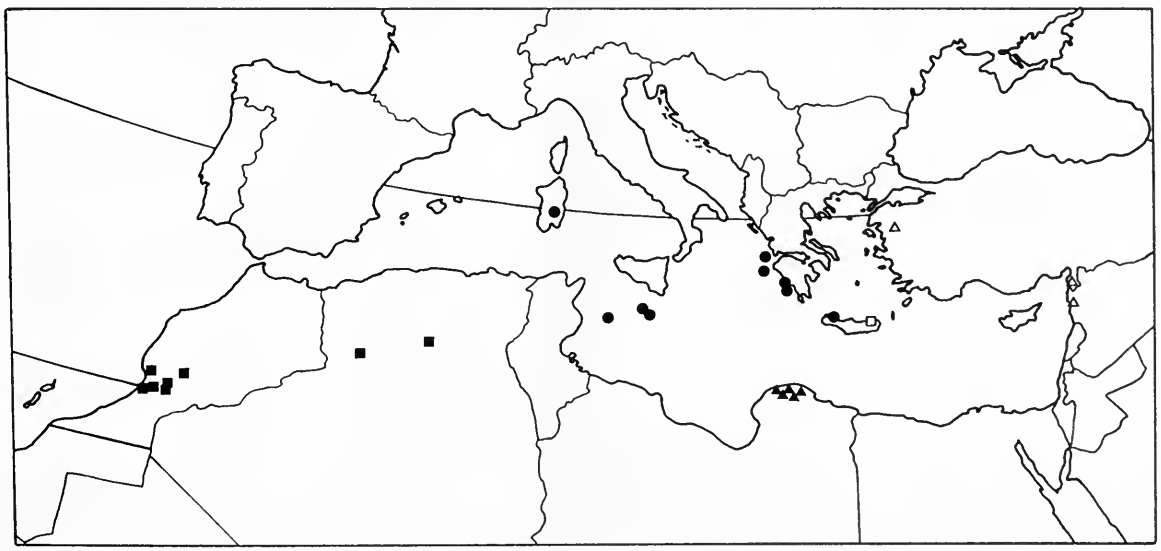
Elodes aegyptica (L.) [Payer, *Traité organogén.*: 8, t. 1 (1857) ['*aegyptiaca*'] sine basionym ex] Y. Kimura in *J. Jap. Bot.* **11**: 831 (1935), in Nakai & Honda, *Nova fl. jap.* **10**: 18 (1951).

Triadenia aegyptica (L.) Boiss. ['*aegyptiaca*'] var. *microphylla* (Spach) Maire (in sched. 1961).

The above synonymy includes all names that are based on the Linnaean type, even though some of the references are concerned wholly or partly with subspp. *maroccanum* or *webbii*, not subsp. *aegypticum*.



Shrub or shrublet 0.05–2 m, tall, much branched, bushy or ± spreading, with branches erect to divergent or rarely decumbent to ascending; wholly glabrous, without dark glands. *Stems* 2 (rarely 4)-lined and ancipitous at first, soon terete, glaucous, with internodes shorter than leaves. *Leaves* free, sessile to shortly (*c.* 0.5 mm) petiolate, persistent for *c.* 2 seasons; lamina (3–)3.5–18 × (1–)1.5–5 mm, narrowly to broadly elliptic or narrowly oblong, concolorous, ± densely glaucous, coriaceous, apex acute to obtuse, margin plane to incurved-cucullate, base cuneate; venation: 1 pair of laterals or 1-nerved, with midrib sometimes pinnately branched and ± prominent beneath; laminar glands dense; marginal glands dense. *Inflorescence* 1-flowered, terminal and from up to *c.* 4 axils below, with short flowering branches (usually after a 'sterile' region) from up to *c.* 11 nodes, or 'sterile' region absent and flowers or flowering branches from up to *c.* 22 nodes, the whole spiciform, with elongate branches originating below flowering region; bracts absent or foliar, clasping calyx, persistent, with glands punctiform and striiform;



Map 24 Sect. 25: 1. *H. aegypticum*: a. subsp. *maroccanum* ■; b. subsp. *webbii* ●, also NE Crete; c. subsp. *aegypticum* ▲; 2. *H. russeggeri* Δ (see also Map 23); 3. *H. aciferum* □.

pedicels very short or absent. *Flowers* *c.* 5–10 mm in diam.; buds narrowly ovoid-ellipsoid, subacute. *Sepals* green, (2.5)–3.5–5.5 × 1–2 mm, imbricate, subequal, oblong to elliptic or lanceolate-elliptic, rounded to apiculate or obtuse, ± cucullate, stiffly erect; veins *c.* 9, only midrib prominent, unbranched; laminar glands linear; submarginal glands rather dense. *Petals* bright to rather pale yellow, persistent in fruit, 6.5–12(–14) × 2–3 mm, *c.* 2 × sepals, oblanceolate, distally outcurved to form hypocrateriform pseudo-tubular corolla, rounded, with basal ligulate appendage oblanceolate-spathulate to narrowly oblong with margin incurved. *Stamens* 18–*c.* 48 (i.e. single fascicle 5–10, double fascicles 5–29), with filaments in each fascicle *c.* 0.6–0.7 united, the longest 2.5–6.5 mm (long-styled) or 6–9 mm (short-styled), 0.3–0.5 × petals (long-styled) or 0.75–0.95 × petals (short-styled), persistent in fruit. *Fasciclodes* (lodicules) *c.* 0.6–0.7 mm long, flat-topped. *Ovary* 1.5–4 × 0.5–1 mm, narrowly ellipsoid to very narrowly ovoid-conic, acute to truncate; styles 0.5–1 mm (short-styled) or 2.3–3.2 mm (long-styled), 0.25–0.33 × ovary (short-styled) or 2.25–4 × ovary (long-styled), erect; ovules ∞ on each placenta. *Capsule* 5–7 × 3–3.5 mm, cylindric-ellipsoid to rather broadly ellipsoid, longer than sepals, with valves longitudinally vittate. *Seeds* dark brown, *c.* 1.5 mm long, ecarinate; testa finely linear-foveolate to linear-rugulose; caruncle often lobed (cf. Reynaud, 1985: 91, t. 2, ff. 5, 6). 2n = 20 (subsp. *maroccanum*) (Ornduff in Robson, 1977*a*: 334).

In fissures of limestone rocks or on limestone scree in valleys, often coastal; 30–*c.* 1600 m (Morocco), *c.* 1000–1200 m (Algeria), 0–500 m (Malta, Lampedusa), 700–800 m (Sardinia), 0–300 m (Ionian Islands, Peloponnisos), coastal (Crete), 1–750 m (Cyrenaica).

South Morocco (coast, Grande Atlas, Anti-Atlas), Algeria (Atlas), Lampedusa, Maltese Islands (Malta, Gozo, Comino), Sardinia (south-east), Ionian Islands (Kefallinìa, Zakinthos), Greece (eastern Peloponnisos), Crete (north-west, north-east), Libya (Cyrenaica near Derna). Not known from Egypt.

H. aegypticum has a very disjunct distribution from south Morocco via the southern slope of the Atlas Mts in Algeria, Lampedusa, Malta, Sardinia, the Ionian Ialands, the Peloponnese and Crete to Cyrenaica, the whole forming a morphological and geographical cline in the direction indicated. Thus the Moroccan and Algerian plants are erect (to 2 m) with long sessile leaves and large flowers, the island and Peloponnese plants are erect to spreading with intermediate length, sessile to subpetiolate leaves and intermediate-sized flowers, and the Libyan plants are low and spreading with small petiolate leaves and small flowers. Throughout this wide range the variation is almost continuous; but it is possible, I think, to separate an island and Peloponnese form from the African forms at subspecies level, viz. as subspp. *maroccanum*, *webbii* and *aegypticum*.

H. aegypticum is the most primitive species in sect. *Adenotrias*, its nearest relative apparently being a Socotran member of sect. 1. *Campylosporus*, *H. balfourii*. It differs from the Socotran plant in size of leaf and flower, but also particularly in the heterostyly and other adaptations for specialized insect pollination (pseudo-tubular flowers, petal appendages, fasciclodes acting like grass lodicules by swelling to open the flower, stamen filaments united) and dispersal (carunculate seeds). The narrow leaves of the primitive (Moroccan) form are more similar to the those of *H. balfourii* than to those of the latter's close relative, another Socotran endemic, *H. socotranum*.

1a. **Hypericum aegypticum** subsp. **maroccanum** (Pau) N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23:** 68 (1993). Type as for *H. aegypticum* var. *maroccanum* Pau.

H. aegypticum sensu Braun-Blanquet & Maire in *Bull. Soc. Hist. nat. Afr. N.* **22**: 107 (1931) ['*aegyptiacum*']; Jah. & Maire, *Cat. Pl. Maroc* **2**: 482 (1932); et auct. maroc. et alger. plur.

H. aegypticum var. *maroccanum* Pau in *Cavanillesia* **4**: 157 (1932) ['*maroccana*'] (Spanish); Maire in *Bull. Soc. Hist. nat. Afr. N.* **24**: 206 (1933) (Latin). Type: Morocco, Sud ouest, Cap Ghir, versant Sud, 27 March 1931 (fl & fr), *Jahandiez* 57 (BC-holotype; BM!).

Plant erect, (0.15–)0.3–2 m tall, with branches erect to ascending. *Leaves* sessile, plane; lamina (7–)9–18 × (2–)3–4 mm, narrowly elliptic or narrowly oblong-elliptic, acute. *Sepals* 5–6 mm long. *Petals* 10–12(–14?) mm long.

Morocco, Algeria.

MOROCCO. Sud Ouest: between Agadir and Cap Ghir, 30 m, 1 April 1972 (fl), *Davis* 53959 (BM); 30 km N. of Agadir, 10 km up Immouzer Valley, 300 m, 2 February 1974 (fl), *Miller, Russell & Sutton* 472 (BM, RNG*). Grande Atlas: Immouzerdes-Ida-Outanane to Oulma, 200 m, 19 March 1969 (fl & fr), *P.H. & J. Davis* D.48463 (BM). Anti Atlas: au dessus de Taliouine, 1500–1600 m, *Maire* 1397 (MPU*).

ALGERIA. Atlas Saharien: Mts des Ksour, Djebel Grouz; Djebel Bou Kahil, Ksar Kahil. Both records *fide* Quézel & Santa (1963: 682).

Subsp. *maroccanum* is confined to the southern slopes of the Atlas Mountains and their foothills down to the Atlantic Ocean. In view of the almost strictly maritime distributions of the other subspecies, it is tempting to suggest that the southern edge of the Atlas is an ancient coastal region. Perhaps, as Melville (1967: 293) has suggested, the ancient Tethys Sea was to the south of the Atlas, not, as most workers still believe, to the north of it.

1b. **Hypericum aegypticum** subsp. **webbii** (Spach) N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 68 (1993). Type as for *Triadenia webbii* Spach.

H. maritimum Sieber, *Reise Kreta* **2**: 322 (1823); C.B. Presl in *Oken, Isis* **21**: 275 (1828); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 175 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 140 (1933), **12**: 81 (1934). Type: Crete, Cap Maleca, Perivolizza [Perivolitsa], 1817 (fl), *Sieber* s.n. (W?-holotype; H!).

Triadenia webbii Spach in *Annls Sci. nat.* (Bot.) II, **5**: 174, t. 5A (1836), *Hist. nat. vég.* Phan. **5**: 372 (1836), Atlas: t. 119 f. 2 (1846); Hal., *Consp. Fl. Graeca* **1**: 285 (1900). Type: Malta, 'In rupestribus insulae Melitae', *Webb* s.n. (FI-holotype).

T. thymifolia Spach in *Annls Sci. nat.* (Bot.) II, **5**: 174, t. 5B (1836), *Hist. nat vég.* Phan. **5**: 372 (1836), Atlas: t. 119 (1846). Type: Malta, 'In horto insulae Melitae' [Jardin d'acclimitation de l' île de Malte], *Webb* s.n. (FI-holotype).

T. sieberi Spach in *Annls Sci. nat.* (Bot.) II, **5**: 175, t. 5C (1836), *Hist. nat. vég.* Phan. **5**: 373 (1836). Type: Crete: 'In Cretae maritimis', *Sieber* (FI-holotype).

Hypericum spachianum Steud., *Nomencl. bot.* 2nd ed. **1**: 789 (1840). Type as for *Triadenia thymifolia* Spach.

H. webbii (Spach) Steud., *Nomencl. bot.* 2nd ed. **1**: 790 (1840); Nyman, *Syll. fl. Eur.* Suppl.: 222 (1865); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: t. 3 f. 3 (1932).

H. sieberi (Spach) Nyman, *Syll. fl. Eur.* Suppl.: 222 (1865).

Triadenia maritima (Sieber) Boiss., *Fl. orient.* **1**: 784 (1867); Halácsy, *Consp. fl. graec.* **1**: 284 (1900); Hayek, *Prodr. fl. pen. Balc.* **1**: 530 (1925); Rech. f., *Fl. aegaea*: 260 (1943).

T. maritima [var.] B. *webbii* (Spach) Hayek, *Prodr. fl. pen. Balc.* **1**: 530 (1925).

T. maritima subsp. *weissii* Stamatiadou (1971) in sched.

Hypericum aegypticum sensu auct. mult. pro parte excl. typum.

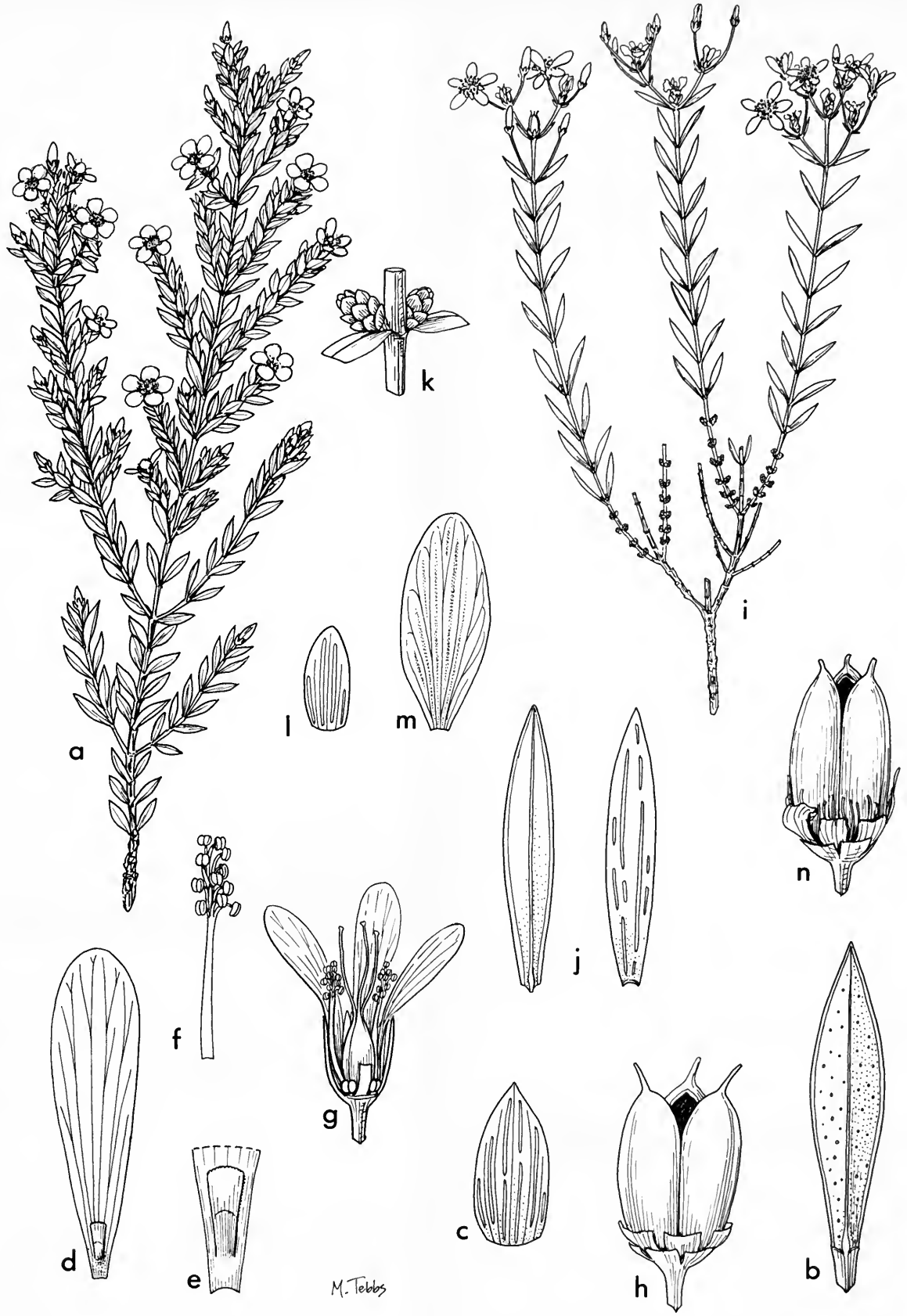


Fig. 22 A. *H. aegypticum* subsp. *maroccanum*: (a) habit; (b) leaf; (c) sepal; (d) petal; (e) petal ligule; (f) stamen fascicle; (g) half flower showing long styles, short stamens and 'lodicules'; (h) capsule. B. *H. heterophyllum*: (i) habit; (j) mature leaf, upper and lower surfaces; (k) condensed axillary shoots; (l) sepal; (m) petal; (n) capsule (a, i × ½; g × 2; b, j, k, × 3; c-f, h, l-n × 4). A. *Davis* 48463. B. *Nyddegger* 15521.

Icones: Ker in *Bot. Reg.* **3**: t. 196 (1817); Hook. f. in *Curtis's bot. Mag.* **106**: t. 6481 (1880).

Plant erect to loosely spreading, 0.04–0.4(–0.6) m tall, with branches erect or usually ± spreading and often tortuous, forming bushes up to 1 m across. *Leaves* subsessile to shortly (*c.* 0.3 mm) petiolate, plane or subcucullate; lamina 4–10 × 1.5–3 mm, narrowly oblong to broadly elliptic, acute to obtuse. *Sepals* 5–6 mm long. *Petals* 8–14 mm long.

Lampedusa, Malta, Sardinia, Ionian Islands, Greece (Peloponnisos), Crete.

LAMPEDUSA. Lampedusa, April 1884 (fl), *Lojacono* 96 (BM, K), May 1898 (fr), *Ross* 117 (JE, K).

MALTA. Malta: Oued Babur, S. of Qrendi, 50–100 m, 10 March 1970 (fl), *Davis* 49443 (K); Dingli, 1926 (fl), *Bankart* s.n. (BM). Comino: *fide* Borg (1927: 247) and Haslam, Sell & Wolseley (1977: 199). Gozo: Wied Xlendi, 21 March 1872 (fl), *Duthie* s.n. (BM).

SARDINIA (Central). Nuoro: valley of R. Flumendosa between Seulo and Villanovatulo, 700–800 m, *fide* Arrigoni (1965).

IONIOI NISOI. Kefalinnia [Cephalonia]: [Argostoli] Hagios Theodoros, 10–15 May 1926 (fl), *Bornmüller* 283 (BM, JE, K). Zakinthos [Zante]: Agios Georgios near Volimes, 0–300 m, 11 January 1940 (fl), *Davis* 1107 (BM, K); near Kampi, *c.* 250 m, 1 April 1980 (fl), *Young* 630 (H, K).

GREECE. Peloponnisos, Messina: Island of Sphakteria [Sfakteria], S. extremity, April 1862 (fl), *J.S. Mill* s.n. (K); distr. Trifilia, NW of Gargaliani above bifurcation to Marathoupolis, 300 m, 30 April 1971 (fl), *Stamatiadou* 71 (ATH*, BM).

KRITI. Kidhonia: Peninsula Akrotiri, prope Perivolitsa, 20–50 m, 10 October 1966 (st), *Greuter* 7706 (G*, K); Maleca (Perivolizza), 1820 (fl), *Sieber* s.n. (FR, G–DC, H, JE, K). Sitia: small bay NE of the Faneromani Monastery, coastal cliffs, 31 March 1982 (fl?). *Kalheber* 82–456 (Herb. Kalheber.*, Herb. Greuter.*).

CULTIVATED. Specimens seen from France (1813–1825), Germany (Berlin, 1818–1888) and England (1836–1991). According to Hooker (1880), *H. aegypticum* was introduced into cultivation by André Thouin in 1787.

Although *H. maritimum* (NW Crete) has been separated from the other European populations of *H. aegypticum* mainly because of its spreading habit, this does not provide a differentiating character. Indeed Greuter (in Greuter, Matthäs & Risse, 1984) describes the plants at the second Cretan locality as 'more normal-looking', and Turland's photograph (1990: 313) bears this out.

Hooker described plants in cultivation at Kew as hardy when given a little basal winter protection, and as growing erect in sheltered locations, observations which agree with my experience when growing it in east Surrey.

1c. **Hypericum aegypticum** subsp. **aegypticum**

For synonymy (including pro parte) see p. 148.

Plant spreading, 0.05–0.18 m tall, with branches ± spreading and tortuous, forming low bushes. *Leaves* shortly (0.4–0.5 mm) petiolate, always(?) ± incurved-cucullate; lamina 3–6 × 1–2 mm, narrowly oblong to broadly elliptic, acute. *Sepals* 3.5–5 mm long. *Petals* 6.5–9 mm long.

Libya (Cyrenaica – Jebel el Akhdar).

LIBYA. Cyrenaica: Wadi Derna, second scarp above Apollonia, 4 April 1939 (fl), *Simpson* 39291 (BM), *Sandwith* 2342 (K); 12–15 km W. of Derna on Gubba road, 300 m, 28 July 1970 (fl), *Davis* 50231 (K); Messa a ovest di Cirene, U. Tmista, 29 April 1934 (fl), *Pampanini & Pichi-Sermolli* 4986 (BM, FI*, K).

Although the type is said to be from 'Aegypto', there is no likely habitat for *H. aegypticum* in the Mediterranean part of Egypt. Linnaeus's own figure shows a small-leaved plant that matches those in the Libyan population. It is thus all but certain that the type comes from Jebel el Akhdar.

2. **Hypericum russeggeri** (Fenzl) R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 209 (1893), 2nd ed. **21**: 175 (1925); Boul., *Fl. Liban*: 67 (1930); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: tt.2 f. 2, 3 f. 2 (1932), **11**: 140 (1933), **12**: 81 (1934), in *Pflanzenareale* **4**(1): Karte 1a (1933); N. Robson in P. Davis, *Fl. Turkey* **2**: 370, ff. 11.8, 13.3 (1967); Mouterde, *Nouv. Fl. Liban Syrie* **2**: 521, t. 224 f. 3 (1970); Reynaud in *Adansonia* **7B**: 88, tt. 1 f. 4, 2 ff. 1–2 (1985); Greuter, Burdet & Long, *Med-Checklist* **3**: 272 (1986). Type as for *Triadenia russeggeri* Fenzl.

Maps 23, 24.

Triadenia russeggeri Fenzl, *Pug. pl. nov. Syrie*: 7 (1842), in Russegger, *Reisen* **1**(2): 907 (1843), Atlas **3**: t. 13 (1843); Boiss., *Fl. orient.* **1**: 784 (1867); Post, *Fl. Syria* 2nd ed. **1**: 227 (1932); Rech.f., *Fl. aegaea*: 260 (1943). Type: Turkey, 'Hab. in Syria prope Svedie. et ostia Orontis', 1836 (fl), *Kotschy* 101 (W!-holotype; BM!, E!, G!, K!, U!-isotypes). The labels on the Kotschy and Montbret collections of 1836 have led to a certain amount of confusion. Most specimens of *Kotschy* 101 merely state 'In monte Tauro'. The Edinburgh specimen, however, has 'Syria, Svedia' (i.e. Turkey, vil. Hatay) and *Kotschy* 111 (K) has 'circa Swediam prope Antioch'. It would seem likely, then, that Svedia is the type locality.

Elodea russeggeri (Fenzl) Walp., *Repert. bot. syst.* **1**: 391 (1842).

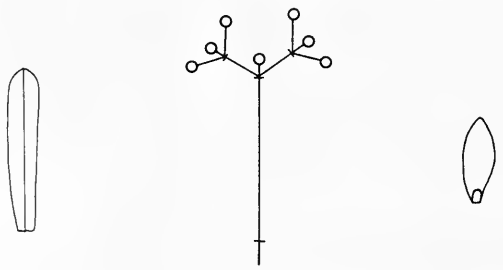
Adenotrias phrygia Jaub. & Spach, *Ill. pl. orient.* **1**: 76, t. 39 (1842). Types: Turkey, Çanakkale, 'crescit in Phrygia, prope Adramiti' [Edremit] [1836], *Montbret* s.n. (FI-lectotype, selected here); Turkey, 'ad montes Cassii radices, in rupestribus secus Orontem', [May 1834] (fl), *Aucher* 872 (P-syntype; BM!, G!, K!-isotypes).

A. kotschyi Jaub. & Spach, *Ill. pl. orient.* **1**: 77 (1842). Type: Turkey, 'in Tauro', *Kotschy* 101 (P-holotype). See note under *Triadenia russeggeri*.

Hypericum empetrifolium sensu Kotschy ex Jaub. & Spach, *Ill. pl. orient.* **1**: 77 (1842), in synon. *Adenotrias kotschyi*.

Elodes russeggeri (Fenzl) Greuter in *Candollea* **20**: 216 (1965).

Icon: Jaub. & Spach, *Ill. pl. orient.* **1**: 76, t. 39 (1842).



Shrub or shrublet 0.1–0.3 m tall, much branched, spreading to prostrate, with branches ascending to prostrate, often ± tortuous; wholly glabrous, without dark glands. *Stems* 4-lined and ancipitous at first, soon 2-lined, glaucous, with internodes shorter to rarely longer than leaves. *Leaves* free, sessile or subsessile, persistent until second season; lamina 4–20 × 1.5–3 mm, narrowly oblanceolate, concolorous, ± densely glaucous, coriaceous, apex obtuse, margin plane or proximally incurved, base cuneate; venation: apparently 1-nerved, with midrib sometimes prominent beneath; laminar glands ± dense. *Inflorescence* 3–7(–9)-flowered, terminal and sometimes also terminating short shoots or solitary in axils of lowermost (fallen) leaves; bracts foliar; bracteoles linear, squamiform, deciduous; peduncle 10–20 mm long, pedicels 1.5–2.5 mm long. *Flowers* *c.* 10 mm in diam.; buds narrowly ovoid-ellipsoid, subacute. *Sepals* green, 2–3 × 0.7–0.9 mm, imbricate, subequal, narrowly oblong to

narrowly triangular-lanceolate, subrounded to acute, plane to incurved, stiffly erect; veins 5(–7?), only midrib sometimes prominent, unbranched; laminar glands linear; submarginal glands dense. *Petals* rather pale yellow, deciduous, 6–9 × *c.* 3–4.5 mm, *c.* 3 × sepals, oblanceolate, distally outcurved to form hypocrateriform pseudo-tubular corolla, rounded, with basal ligulate appendage oblanceolate? with margin incurved. *Stamens c.* 30 (i.e. single fascicles *c.* 8, double fascicles *c.* 10–12), with filaments in each fascicle *c.* 0.8 united, the longest *c.* 3–4.5 mm (long-styled) or 4.5–5 mm (short-styled), deciduous later than petals. *Ovary* 1.5 × 0.7 mm, narrowly ellipsoid, acute; styles *c.* 1.5 mm (short-styled) or 2 mm (long-styled), about equalling ovary (short-styled) or *c.* 1.35 × ovary (long-styled), suberect; ovules 2 on each placenta one ascending, one pendent. *Capsule* 2.5–4 × *c.* 1–1.5 mm, cylindric-ellipsoid, longer than sepals, with valves longitudinally vittate. *Seeds* blackish brown, *c.* 2 mm long, ecarinate; testa finely densely linear-scalariform; caruncle lobed (cf. Reynaud, 1985: 91, t. 2 ff. 1–2). 2n = 20 (n = 10; Reynaud, 1981).

Among calcareous rocks; sea level –100 m.

Turkey (Hatay; probably extinct in Çanakkale); Syria (northern coast).

TURKEY. Çanakkale: Edremit [prope Adramiti], 1836 (fl), *Montbret* s.n. (FI*). Hatay: Antakya, d. Samandağ, near Çevlik, 100 m, 6 May 1965 (fl), *Coode & Jones* 636 (E), 636A (K); Monte Cassio [Akra Dağ], May 1834 (fl), *Aucher-Eloy* 872 (BM, G, K).

SYRIA. Nusairy Mts [Jebel el Ansariye], Banias [Baniyas], 13 April 1885 (fl), *Post* s.n. (BM); Slerifé, route de Nasimata vers Ghab, 1973 (fl), *Reynaud* 73.204 (MARS).

H. russeggeri differs from *H. aegypticum* in (for example) leaf shape, the deciduous petals and stamens and the 2-ovulate placentae. It 'continues' the discontinuous eastward cline of that species beyond Crete, into Asia Minor and Syria, where it occurs in similar maritime and submaritime habitats. It would appear to be extinct near Edremit (if Montbret's locality is accurate) and to be restricted now to the coast and foothills of the southern Amanus mountains (Gâvur dağlari) and Akra Dağ round the mouth of the Orontes (Asi). Boissier's 1846 locality 'ad ruinas Seleuciae' refers to Seleucia Pieria at the mouth of the Orontes, not to Seleucia (Silifke) on the coast south-east of Mersin (vil. Içel).

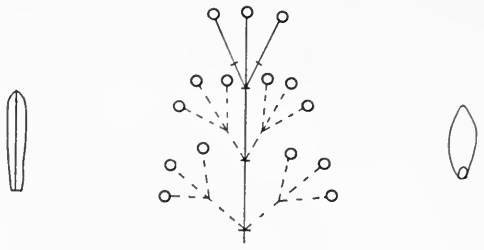
3. **Hypericum aciferum** (Greuter) N. Robson in *Repert. nov. sp.* **74**: 23 (1967), in Tutin et al., *Fl. Europaea* **2**: 264 (1968); Greuter in *Ann. Mus. Goul.* **1**: 39 (1973); I. Hagemann in *Bot. Jb.* **102**: 247 (1981); Turland in *Q. Bull. alp. Gdn Soc.* **58**: 310 & fig. (1990), in *Bot. J. Linn. Soc.* **108**: 351 (1992); Turland, Chilton & Press, *Fl. Cretan area*: 93, map 672, t. 4 f. 2 (1993). Type as for *Elodes acifera* Greuter.

Map 24.

Elodes acifera Greuter in *Candollea* **20**: 215, f. 13 (1965). Type: Crete, prov. Sfakià, ad ostium faucium Dòmata, 20–40 m, 5 June 1962 (fl & fr), *Greuter* 4669 (Herb. Greuter.-holotype; BM!, G, LD, W, Z!-isotypes). The holotype is long-styled; *Greuter* 4669a (Herb. Greuter.) is short-styled.

Icon: Greuter in *Candollea* **20**: 215, f. 13 (1965).

Shrublet c. 0.05–0.06 m tall, much branched, prostrate to ascending, elongate, ± tortuous, distally ascending and bearing short erect to ascending clustered flowering shoots, forming mats over 600 mm in diam; wholly glabrous, without dark glands. *Stems* 2-lined at first, soon terete, densely glaucous, with internodes shorter than leaves.



Leaves free, sessile, persistent until second season; lamina 5–12 × 0.6–1.4 mm, narrowly linear-spathulate, aciform, concolorous, densely glaucous, coriaceous, apex acute to subacute, margin plane or incurved or lamina subtriquetrous, base narrowly cuneate; venation: 1-nerved, with midrib subprominent beneath; laminar glands distally dense or all scattered. *Inflorescence* (1)2–3-flowered, terminal and terminating short axillary shoots; bracts foliar, bracteoles linear-acicular, deciduous; peduncle *c.* 2 mm long, pedicels 1–2 mm long. *Flowers c.* 8 mm in diam.; buds narrowly ovoid, acute. *Sepals* green, 3–3.5 × 1 mm, imbricate, equal, narrowly oblong or narrowly oblong-lanceolate to linear, obtuse, plane to subincurved, suberect; veins 5, only midrib sometimes prominent, unbranched; laminar glands linear, submarginal glands rather sparse. *Petals* bright yellow, deciduous, *c.* 7.5 × 1.5 mm, *c.* 2.5 × sepals, oblanceolate, apically outcurved to form very short-lipped pseudo-tubular corolla, rounded, with basal ligulate appendage linear, acute. *Stamens* 9 (i.e. 3 fascicles of 3), with filaments in each fascicle almost completely united, the longest 3.5–4.5 mm (long-styled) or *c.* 1.5 mm (short-styled), persistent (? or tardily decicuous). *Fasciclodes* (lodicules) 0.3 mm long, truncate. *Ovary* 1.5 × 1 mm, ovoid, acute; styles *c.* 3 mm (long-styled) or scarcely 0.5 mm (short-styled), 2 × ovary (long-styled) or 0.33 × ovary (short-styled), suberect; ovules 2 on each placenta, one ascending, one pendent. *Capsule c.* 4 × 2 mm, narrowly ovoid, longer than sepals, with valves longitudinally vittate. *Seeds* not seen.

Among calcareous rocks; 5–40 m.

Crete (south-west); known from only two localities.

KRITI. Sfakià, lower part of Domatà gorge, near Aj. Rùmeli, 20–40 m, 5 June 1962 (fl), *Greuter* 4669 (BM, Z); Selinos-Sfakià, mouth of Tripiti gorge, W.-facing side, 26 October 1989 (fl), *Turland* 105 (BM).

This most reduced member of sect. *Adenotrias* has a very restricted relict distribution. It is more prostrate than *H. russeggeri* (its nearest relative) and has narrower leaves, fewer flowers, petals that curve out only at the tip, and (probably) persistent stamen fascicles with fewer stamens per fascicle. Although it is apparently so rare, its habitat would seem to be similar to those of *H. aegypticum* and *H. russeggeri* (Turland, 1992: 351).

Sect. 26. **HUMIFUSOIDEUM** R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* **3**(6): 211 (1893).

Hypericum sect. *Pulogensia* N. Robson in *Blumea* **20**: 259 (1973 ['1972']).

Hypericum sect. 9. *Hypericum* sensu N. Robson in *Bull. Br. Mus. nat. Hist.* (Bot.) **5**: 320 (1977) pro parte, quoad syn. sect. *Pulogensia*, i.e. spp. Taiwan. incl.

Shrubs, subshrubs or wiry perennial herbs, erect to prostrate, up to 1.5 m tall, the shrubs evergreen, glabrous, usually with dark glands; branching pseudo-dichotomous and/or lateral. *Stems* 2–4(6)-lined and ancipitous when young, sometimes becoming 2-lined or terete, eglandular or rarely black-dotted; cortex green or usually wine-red; bark smooth, red-brown to grey-brown. *Leaves* opposite, decussate, sessile or very shortly petiolate, free, in shrubs eventually deciduous

at base; lamina entire, with venation pinnate, open or closed, the tertiary reticulation absent or rudimentary or rarely rather conspicuous; laminar glands pale, linear to punctiform, ± prominent; submarginal glands absent; intramarginal glands pale and/or dark, dense to rarely sparse; ventral glands absent. *Inflorescence* 1-flowered with branches pseudo-dichotomous or rarely up to 10-flowered with branches dichasial/monochasial or mixed, from up to 2 nodes, rarely with flowering branches from up to 10 lower nodes; bracts and bracteoles foliar, rarely somewhat reduced. *Flowers* stellate or rarely ± obconic (Sp. 4), homostylous. *Sepals* 5, free, persistent, erect to somewhat spreading in fruit, with margin entire or rarely (Spp. 6(i) p.p., 7a) irregularly glandular-ciliate; laminar glands pale, linear to punctiform; submarginal glands absent; inframarginal glands or marginal glands pale and/or dark (black or rarely reddish) or absent. *Petals* 5, persistent, spreading after flowering, with apiculus subterminal or obsolete or absent; margin entire; marginal glands absent or few or rarely forming a row (Spp. 6(i) p.p., 7), black (sometimes ± prominent) or rarely pale; laminar glands linear to punctiform, pale and/or black. *Stamen fascicles* 3–5, obscure, or stamens not obviously in fascicles, persistent, with stamens 13–80; filaments basally united or apparently free; anthers yellow, gland amber or black; pollen type X. *Ovary* with 3–5(6) parietal (intrusive) to axile placentae, each ∞-ovulate; styles free, bases contiguous; stigmas narrowly or scarcely capitate. *Capsule* 3–5(6)-valved, subcoriaceous to chartaceous, with valves longitudinally vittate, rarely also diagonally vittate (Sp. 6) or almost smooth (Sp. 7b) or thin-walled, bacciform and indehiscent (Sp. 10). *Seeds* cylindric, not or scarcely carinate; testa linear-reticulate to linear-foveolate or scalariform or scalariform-reticulate.

BASIC CHROMOSOME NUMBERS (X). 12, 9, 8; ploidy 2.

HABITAT. Wet to dry upland grassland, woodland clearings and disturbed ground; 1500–4300 m (New Guinea), *c.* 2800 m (Luzon), 1800–3997 m (Taiwan), 1800–3300 m (Java, Sumatra), 300–3600 m (Africa, Madagascar).

DISTRIBUTION. New Guinea (Papua/New Guinea and Irian Jaya), Philippines (northern Luzon), Taiwan, Indonesia (Sumatra, Java), Madagascar, Africa (Cape Province to Ethiopia, Sudan Republic, Zaire and Angola; also Cameroon and Fernando Poo).

12 species (+ 1 subspecies).

N.B. At a late stage in the work on Part 6, I realized that my original idea (Robson, 1973) that the relationships of two Taiwan species were with *H. pulogense* Merr. (from Luzon) was correct, and that they were not, as I had subsequently concluded (Robson, 1977*a*), related to a Japanese species of sect. 9. *Hypericum*, *H. yezoense* Maxim. Indeed, the shrublet or wiry herbaceous habit of these two species would be quite anomalous in sect. *Hypericum*. *H. nagasawai* Hayata and *H. nokoense* Ohwi have therefore had to be inserted in the numerical sequence of sect. *Humifusoideum* as Spp. 6(i) and 6(ii) respectively.

Key to sect. 26 *Humifusoideum*

1 Flowers solitary, with branching almost always wholly lateral; leaves relatively narrow (lanceolate or narrowly elliptic to linear), sessile; shrub or shrublet 2

Flowers in dichasia with branching lateral or, if solitary, then branching pseudo-dichotomous[7] or basal; leaves relatively broad (ovate or oblong or elliptic to orbicular) or, if oblanceolate to linear (Spp. 6(i), 7b, 10 p.p.), then shortly petiolate and/or plant a wiry herb 4

2(1) Leaves spreading or ascending, (7–)8–12 mm long, plane; styles (2–) 2.5–4 mm long ..... 1. **sewense**

Leaves imbricate-appressed, 2–9 mm long, plane to incurved; styles 1.5–2.5 mm long 3

3(2) Leaves ± incurved, narrowly elliptic or lanceolate-elliptic to linear, laminar glands mostly linear to striiform; placentation parietal; black glands nearly always present at least on anthers ..... 2. **saruwagedicum**

Leaves plane, ovate-lanceolate to elliptic or narrowly elliptic-oblong, laminar glands mostly striiform to punctiform; placentation axile; black glands completely absent ..... 3. **macgregorii**

4(1) Leaf laminar glands all or mostly linear, sometimes with parallel rows of dots; inflorescence branching wholly pseudo-dichotomous or with weak 1-flowered laterals from 1–2 nodes below; erect shrub ..... 4. **bifurcatum**

Leaf laminar glands all or mostly shortly striiform and/or punctiform; inflorescence branching various, if wholly pseudo-dichotomous, then plant a diffuse herb 5

5(4) Inflorescence branching dichasial or mixed dichasial/pseudo-dichotomous; plant an erect or straggling shrub or shrublet ..... 5. **papuanum**

Inflorescence branching pseudo-dichotomous or, if dichasial, then plant a ± diffuse rhizomatous shrublet or suffrutescent herb 6

6(5) Styles longer than or equalling ovary; fruit capsular 7

Styles shorter than ovary or, if equalling or longer than it (Sp. 10), then fruit baccate 11

7(6) Plant without black glands; leaves ovate to elliptic or oblong, with at least some striiform glands ..... 6. **pulogense**

Plant with at least anther gland black; stems diffuse, wiry; leaves ovate to linear, with glands punctiform or somewhat elongate ... 8

8(7) Flowers 12–30 mm in diam.; inflorescence branches (when present) axillary; plant suberect to ascending 9

Flowers 7–10 mm in diam.; inflorescence branches (when present) pseudo-dichotomous; plant usually diffuse, ascending to decumbent (7. **H. beccarii**) 10

9(8) Sepals without black laminar streaks or, if with them, then apex obtuse; leaves variable in size and shape but, if under 15 mm long, then narrow (l:b = 4–12) ..... 6(i) **H. nagasawai**

Sepals with black laminar streaks, apex acute to subacuminate; leaves short (4–12 mm long) and broad (l:b = 2–3.1) ..... 6(ii) **H. nokoense**

10(8) Leaves broadly oblong to elliptic-oblong or narrowly obovate; capsule densely and prominently vittate ..... 7a. **beccarii** subsp. **beccarii**

Leaves oblanceolate to linear; capsule sparsely and obscurely vittate (almost smooth) ..... 7b. **beccarii** subsp. **steenisii**

11(6) Fruit capsular, usually erect; styles usually 3–4 12

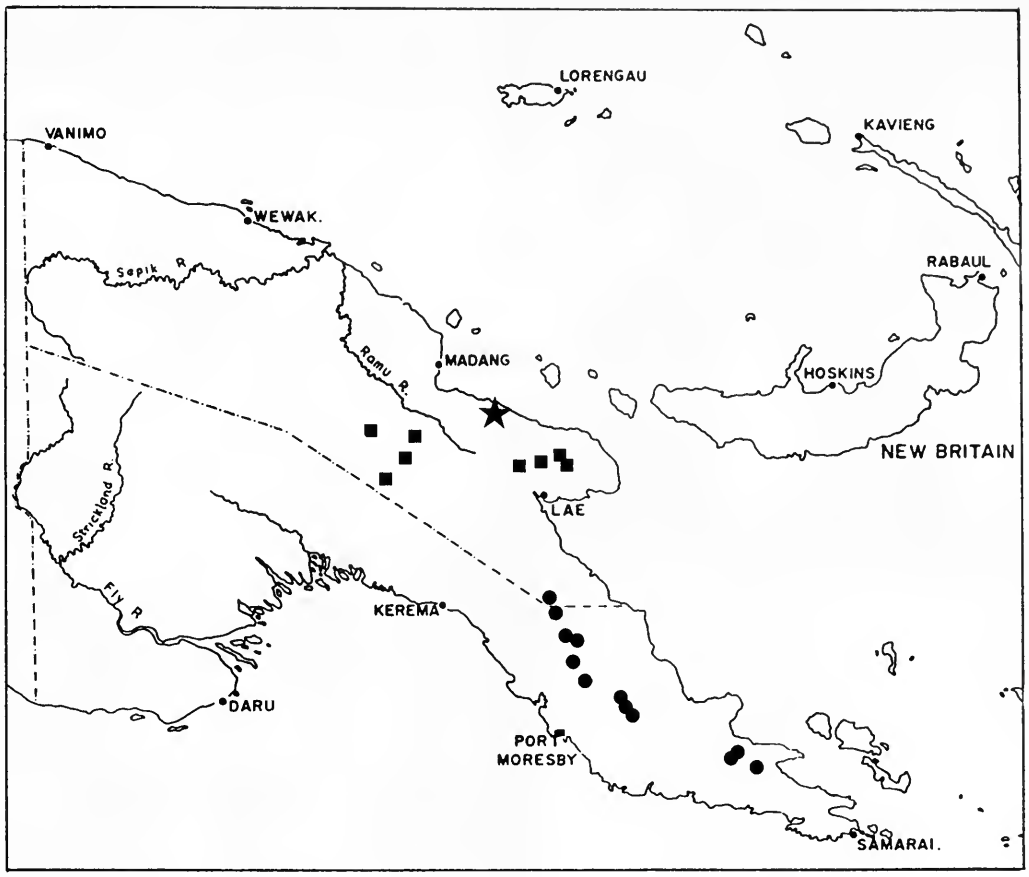
Fruit baccate, on reflexed pedicel; styles 4–5 ... 10. **peplidifolium**

12(11) Stems erect, stout; leaves usually sessile ..... 8. **natalense**

Stems decumbent to ascending, slender; leaves shortly petiolate ..... 9. **wilmsii**

[7] I.e. with (usually) paired axillary branches continuing growth from uppermost node of flowering branch.

1. **Hypericum sewense** N. Robson in *Blumea* **20**: 254 (1973), in Steenis, *Fl. Males.* I, **8**: 21, ff. 14, 15 (1974); P. Royen, *Alpine Fl.*

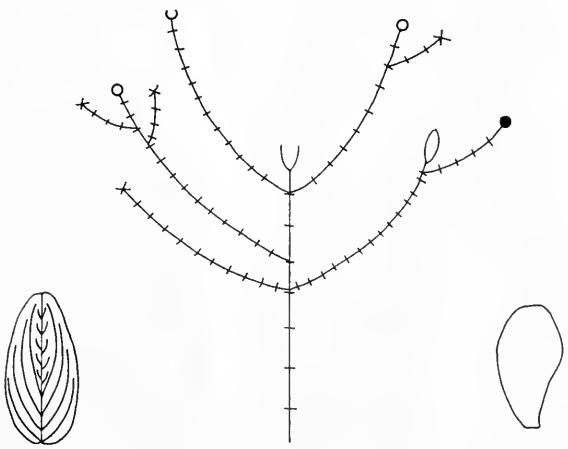


Map 25 Sect. 26. 1. *H. sewense* ★; 2. *H. bifurcatum* ■; 4. *H. macgregorii* ●.

New Guinea **3**: 1472, f. 464 (1982). Type: New Guinea, Madang Distr., Saidor subdistr., Finisterre Mts, Naho-Rawa Divide, Sewe, Lake Naho, *c.* 2700 m, 13 November 1964 (fl & fr), *Sayers* NGF 21418 (BM!-holotype; L!-isotype).

Fig. 23A, Map 25.

Icon: Steenis, *Fl. Males.* I, **8**: 20, f. 14 (1974).



Shrub c. 0.6 m tall, erect, with branches divaricate-ascending, occasionally pseudo-dichotomous, mostly lateral. *Stems* 4-lined and ancipitous when young, soon 2-lined, eventually terete, eglandular. *Leaves* (7–)8–12 × 2–4 mm, lanceolate to narrowly elliptic, concolorous, not glaucous, plane, spreading to ascending; apex rounded, base narrowly cuneate; venation: 2–4 pairs of main lateral veins branched distally, without tertiary reticulation; laminar glands pale, linear to striiform towards base, sometimes flanked by row of streaks or dots, punctiform towards apex and margin, inframarginal glands dense, pale and (6–10) black. *Inflorescence* 1-flowered, without or rarely with one or two flowering branches in uppermost axils, with numerous flowering branches from lower nodes; pedicels 4–9 mm long in fruit. *Flowers* 22–28 mm in diam., stellate; buds narrowly ovoid, subacute. *Sepals* 5–7 × 1.5–2.5 mm, imbricate, equal or subequal, lanceolate, rounded to subacute, entire; veins 5(3), outer branched; laminar glands pale, mostly linear to striiform, punctiform towards apex and margin; inframarginal glands pale or occasionally some black. *Petals* bright yellow, not tinged red, 10–14 × 5–6.5 mm, 2 × sepals, oblong-obovate, rounded, apiculus almost absent; laminar glands pale linear, sometimes interrupted distally; marginal glands absent or 1–3, black, sessile, on or near apiculus. *Stamens* obscurely 3-fascicled, 15–20, longest (6.5–)7–8(–9) mm, 0.65–0.8 × petals; anther gland black. *Ovary* 2.5–3 × *c.* 1.5–2 mm, narrowly ovoid, acute; styles 3, 2–4 mm long, 0.8–1.3 × ovary, narrowly divergent; stigma scarcely capitate; placentae 3, intrusive parietal. *Capsule* (5–)7–9 × (3–)4–5 mm, *c.* 1.1–1.4 × sepals, ellipsoid to ovoid, with valves longitudinally vittate. *Seeds* yellow-brown, *c.* 0.8 mm long, scarcely carinate; testa densely linear-foveolate.

Boggy tussock sedge-grassland; *c.* 2700 m.

New Guinea (Terr. New Guinea – Madang District).

NEW GUINEA. Madang Distr.: Saidor subdistr., Finisterre Mts, Naho-

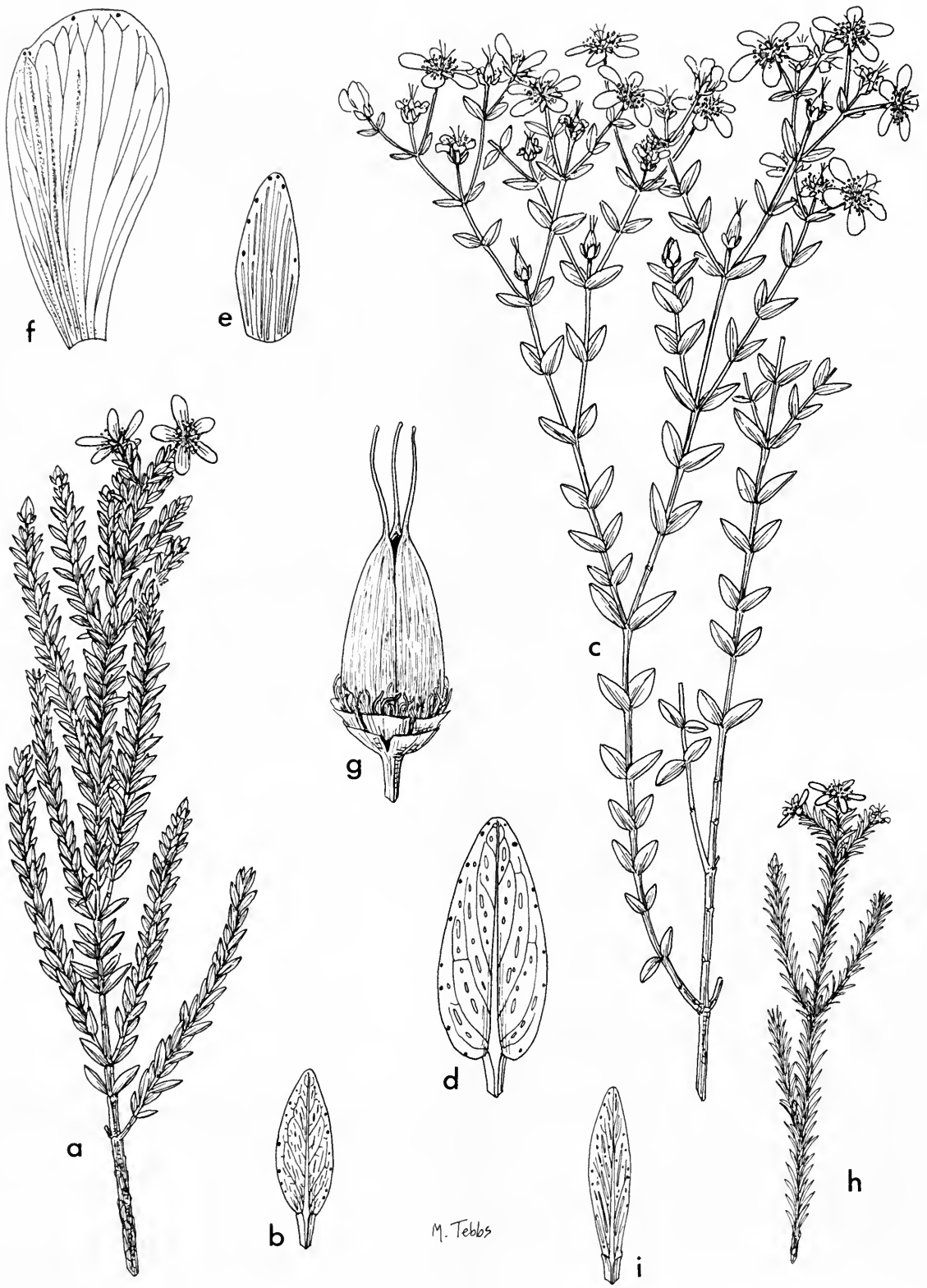


Fig. 23 A. *H. sewense*: (a) habit; (b) leaf. B. *H. papuanum*: (c) habit; (d) leaf; (e) sepal; (f) petal; (g) capsule. C. *H. saruwagedicum*: (h) habit; (i) leaf (a, c, h, × ½; b, d, i × 2; e-g × 5). A. *Sayers* NGF 21418. B. *Hoogland & Pullen* 6012. C. *Iserentant* 9605.

Rawa Divide, Sewe, L. Naho, *c.* 2700 m, 13 November 1964 (fl & fr), *Sayers* NGF 21418 (BM, L).

H. sewense is in most respects the most primitive member of sect. 26. *Humifusoideum*, showing the greatest resemblance to the ancestral sect. 1. *Campylosporus*. In that section, its affinities would seem to be with *H. lanceolatum* subsp. *angustifolium*, which is endemic to Réunion. Apart from its smaller size, it differs from that taxon in its trimerous ovary, with relatively shorter divergent styles and parietal placentation, its fewer 3-fasciculate stamens, and its usually relatively broader leaves with more advanced venation and glandularity.

H. sewense is apparently a rare relict species, having been collected only once.

2. **Hypericum saruwagedicum** Diels in *Bot. Jb.* **62**: 482 (1929); N. Robson in *Blumea* **20**: 257 (1973), in Steenis, *Fl. Males.* I, **8**: 22, ff. 16, 18e (1974); P. Royen, *Alpine Fl. New Guinea* **3**: 1479, f. 466 (1982). Type: New Guinea, Morobe Distr., Saruwaged-Gebirge, Bolan, 3400–3800 m, March–April 1913 (fl & fr), *Keysser* s.n. (B†-holotype; BM!-isotype?). The BM specimen is labelled '3600–4000 m'.

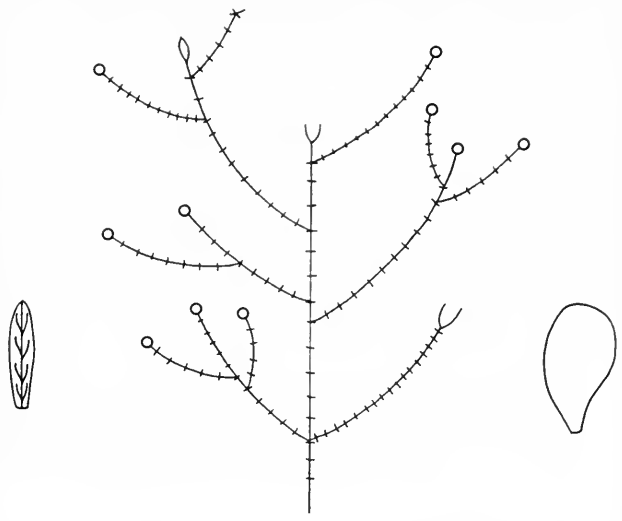
Fig. 23C, Map 26.

H. macgregorii sensu Hoogland in *Blumea*, Suppl. **4**: 231 (1958), non F. Müll. (1889).

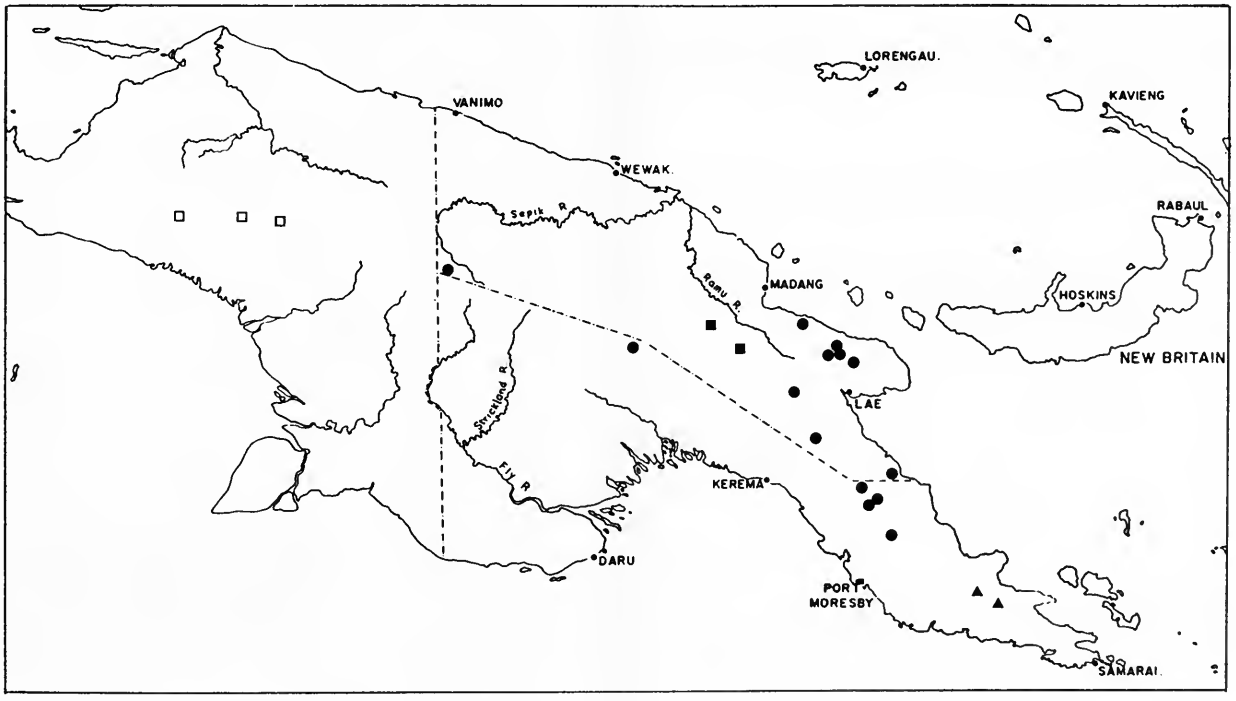
H. macgregorii subsp. *punctatum* N. Robson in *Blumea* **20**: 256 (1973), in Steenis, *Fl. Males.* I, **8**: 21 (1974); P. Royen, *Alpine Fl. New Guinea* **3**: 1478 (1982). Type: New Guinea, Irian Jaya, 6 km NE of Lake Habbema, 3000 m, October 1938 (fl & fr), *Brass* 10660 (A!-holotype).

Icon: P. Royen, *Alpine Fl. New Guinea* **3**: 1480, f. 466 (1982).

Shrub or shrublet, 0.1–0.2 m tall, bushy, ericoid, with branches strict, lateral, creeping and rooting at the base. *Stems* 4-lined when young, soon 2-lined, eventually terete, eglandular. *Leaves* sessile; lamina 2–9 × 0.5–3 mm, narrowly elliptic or lanceolate-elliptic to



linear, concolorous, not glaucous, incurved and proximally slightly carinate, ± imbricate-appressed, rarely distally outcurving; apex rounded, base narrowly cuneate; venation: *c.* 3 pairs of main lateral veins, ± curved-parallel, unbranched except near apex and margin, without noticeable tertiary reticulation; laminar glands pale, linear, sometimes interrupted to punctiform near apex and margin, rarely mostly striiform to punctiform; intramarginal glands spaced, pale only or pale and black. *Inflorescence* 1-flowered, with flowering branches from scattered axils down stem; pedicels 2–4(–8) mm long in fruit. *Flowers* 10–27 mm in diam., stellate or usually ± obconic; buds narrowly ovoid-cylindric, subacute to rounded. *Sepals* 3.5–8 × 1–3 mm, imbricate or not, equal, ovate to lanceolate or elliptic to narrowly oblong, subacute to rounded, entire; veins 7–9, forked and distally branched; laminar glands pale, all or mostly linear or rarely punctate; inframarginal to marginal glands pale only or pale and



Map 26 Sect. 26. 3. *H. saruwagedicum* 'forms': form 1 ■; form 2 ● ; form 3 □; form 4 ▲.

black. *Petals* dark to pale yellow, sometimes tinged red dorsally, 7–15 × 3–6 mm, *c.* 2 × sepals, obovate-oblong to oblanceolate-spathulate, rounded, apiculus absent or almost so; laminar glands pale, linear, sometimes interrupted distally; marginal glands absent or rarely few, black, ± prominent. *Stamens* not obviously 3-fascicled, (13–)20–30, longest 4–7(–9) mm, *c.* 0.5–0.75 × petals; anther gland amber or black. *Ovary* 2–3 × *c.* 1.5 mm, ovoid, acute; styles 3, 1.5–2.5 mm long, 0.5–0.65 × ovary, divergent; stigmas narrowly to scarcely capitate; placentae 3, intrusive parietal. *Capsule* (5.5–)6–9 × 3.5–5 mm, *c.* 1.3–1.5 × sepals, ovoid, with valves longitudinally vittate. *Seeds* orange-brown, 0.5–0.8 mm long, carinate; testa densely linear-foveolate. 2n = 24 (Borgmann, 1964, as *H. macgregorii*).

Alpine grassland, open scrub or rocky slopes, usually in wetter areas; mostly 2730–4300 m, but down to *c.* 1800 m in Milne Bay District.

New Guinea (Irian Jaya – Mts Carstenz and Wilhelmina – to eastern Papua – Mt Dayman).

IRIAN JAYA. 2 km E. of Wilhelmina-top, 3700 m, September 1938 (fl & fr), *Brass & Myer-Drees* 10119 (A, BM, BO, L); Mt Carstenz, IXA naar Dajakweide, 3800–4300 m, November–Decenber 1936 (fl & fr), *Wissel* 133 (L); Lake Habbema, 3225 m camp, August 1938 (fl & fr), *Brass* 9043 (A, BM, BO, K, L, LAE*).

TERR. NEW GUINEA Sepik Distr.: Telefomin subdistr., Sirius Mtn and Sirius Plateau, 3000–3600 m, 23 April 1965 (fl), *Craig* 100 (LAE). E. Highlands Distr.: Mt Wilhelm, vicinity of Mt Piunde, *c.* 3561 m, 1 August 1956 (fl), *Womersley* NFG 8874 (A, BM, BO, CANB*, K, L, LAE*, SING); Kainantu subdistr., Mt Piora, 3150 m, 10 February 1963 (fl & fr), *Henty & Carlquist* NFG 16561 (BO, CANB, K, L). Morobe Distr.: Salawaket Range, Mamsin, *c.* 3820 m, 6 October 1964 (fl & fr), *Hoogland* 10002 (CANB*, K, L, LAE*); Mt Amungwiwa, S. of Wau, 3420 m, November 1963 (fl & fr), *Womersley* NGF 17979 (L, LAE*). Madang Distr.: Saidor subdistr., main ridge of Finisterre Range, Mt Abilala, *c.* 3390 m, 13 November 1964 (fl & fr), *Pullen* 6070 (BM, L, LAE*).

PAPUA. S. Highlands Distr.: Mendi subdistr., Mt Giluwe, 3200 m, 25 December 1973 (fl), *Croft* et al. LAE 60678 (LAE). Central Distr.: Goilala subdistr., Murray Pass, 2730 m, 25 July 1969 (fl & fr), *Foreman* NGF 45562 (K, L); Woitape subdistr., Avios, 1834 m, 25 August 1971 (fl), *Millar* 1208 (LAE). Milne Bay Distr.: Mt Dayman, Maneau Peak, 2780 m, 19 May 1953 (fl & fr), *Brass* 22250 (A, CANB*, K, L, LAE); Mt Suckling, 3330 m, 22 August 1965 (fl & fr), *Gillison* NGF 22384 (L, LAE*).

H. saruwagedicum is a variable species in which the variation falls into four geographical but morphologically more or less intergrading races. Although it is not desirable to give formal names to these races, average members can be recognized by the following characters:

Variant 1 (Mt Wilhelm): Leaves large. Flowers large. Black glands usually on leaves and sepals, not on petals or anthers. Shoot apex outcurving.

Variant 2 (rest of Territory of New Guinea, west Papua): Leaves medium. Flowers large to medium. Black glands on anthers only or absent. Shoot apex erect. This variant is nearest morphologically and geographically to 3. *H. macgregorii*.

Variant 3 (Irian Jaya): Leaves small. Flowers small. Black glands on anthers and rarely leaves. Shoot apex erect.

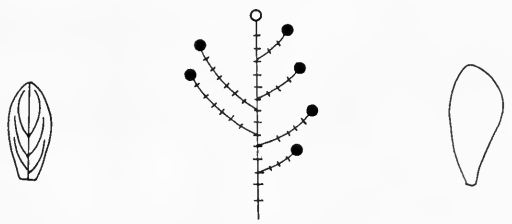
In *Flora Malesiana* (Robson, 1974), *H. saruwagedicum* was differentiated from *H. macgregorii* by its incurved (not flat) leaves with laminar glands mostly linear (not mostly interrupted to punctate). In addition, its ovary placentation is parietal (not axile); and it has black glands on at least some part of the plant, whereas these are absent from *H. macgregorii* An exception was found in one specimen from Irian Jaya (L. Habbema), which has the black glands of *H. saruwagedicum* but leaf characters otherwise similar to those of *H. macgregorii* from east Papua. It was given subspecific rank under the latter species, although geographically remote from it.

It now seems clear that the L. Habbema population is merely an extreme form of Variant 3, the other specimens of which show a trend towards it. *H. macgregorii* can therefore be regarded as constituting another morphological trend from *H. saruwagedicum* in which the black glands have disappeared and the leaves have become smaller, flatter and relatively broader, with the glandular pattern becoming more and more interrupted.

3. **Hypericum macgregorii** F. Müll. in *Trans. R. Soc. Vict.* **1**(2): 2 (1889); Burkill in *Kew Bull.* **1899**: 97 (1899); Lauterb. in *Bot. Jb.* **58**: 4 (1922); Steenis in *Bull. Jard. bot. Buitenz.* III, **13**: 219 (1934); N. Robson in *Blumea* **20**: 255 (1973), in Steenis, *Fl. Males.* **8**: 21, ff. 15, 18f (1974); P. Royen, *Alpine Fl. New Guinea* **3**: 1476, t. 118 (1982). Type: New Guinea, Papua, Central District, summit of Owen Stanley Range, 3900 m, 1889 (fl & fr), *MacGregor* s.n. (MEL!-holotype; BM!, BO!, SING!, WRSL!-isotypes).

Map 25.

Icon: P. Royen, *Alpine Fl. New Guinea* **3**: 1477, t. 118 (1982).



Shrub or shrublet 0.15–1.5 m tall, erect, bushy, with branches strict, nearly always lateral, creeping and rooting at the base. *Stems* 2-lined and ± ancipitous when young, eventually terete, eglandular. *Leaves* sessile; lamina 4–9 × 1–3 mm, ovate-lanceolate to elliptic or narrowly elliptic-oblong, concolorous, not glaucous, plane or ± incurved, ± imbricate-appressed to spreading; apex subacute to rounded, margin plane or undulate, base narrowly cuneate; venation: 3(4–7) pairs of main lateral veins, ± curved-parallel, not visibly branched except near apex and margin, without tertiary reticulation; laminar glands pale, linear towards base, interrupted or punctiform towards apex and margin; intramarginal glands dense, pale. *Inflorescence* 1-flowered, without or rarely with paired flowering branches in uppermost axils, with scattered flowering branches from lower nodes; pedicels 2–10(–20) mm in fruit. *Flowers* 20–25 mm in diam., stellate; buds narrowly ovoid, subacute. *Sepals* 3–6.5 × 0.75–3 mm, not imbricate, equal, elliptic to linear-lanceolate, subacute to obtuse or rarely rounded, entire; veins 7, outer ones branched; laminar glands pale, all linear or some interrupted to punctiform towards apex and margin; inframarginal glands pale. *Petals* dark to pale yellow, sometimes tinged red dorsally, 7–15 × 3–6 mm, *c.* 2–2.5 × sepals, obovate-elliptic, rounded, apiculus absent or almost so; laminar glands pale, linear, sometimes interrupted distally, marginal glands absent. *Stamens* not or obscurely 3(4?)-fascicled, *c.* 17–24, longest 5–8 mm, *c.* 0.6–0.8 × petals; anther gland amber. *Ovary* 2 × 1 mm, ovoid, acute; styles 3(4), 1.5–2.5 mm long, 0.8–1.2 × ovary, divergent; stigmas not capitate; placentae 3(4), axile. *Capsule* 6–8 × 3–4 mm, *c.* 1.3–2 × sepals, ovoid, with valves longitudinally vittate. *Seeds* yellow-brown, *c.* 0.8 mm long, scarcely carinate; testa densely linear-foveolate.

Open alpine rocks, wet slopes and roadsides, usually in shallow soils; (1500–)2700–4000 m.

New Guinea (Terr. New Guinea – Morobe District, Papua).

TERR. NEW GUINEA. Morobe Distr.: above village of Bakaia, *c.* 24 km SE of Garaina, *c.* 2700 m, 24 January 1964 (fl & fr), *Hartley* 12799 (CANB, L, LAE*).

PAPUA. Northern Distr.: Mt Scratchley, 2600 m, 1896 (fl & fr), *Giulianetti* s.n. (K, MEL); Kokoda subdistr., E. side of L. Myolo, 2000 m, 22 July 1974 (fl & fr), *Croft* et al. LAE 61945 (LAE). Central Distr.: Goilala subdistr., Mt Albert Edward, W. side, 3600 m, 21 June 1974 (fl & fr), *Croft* et al. LAE 61389 (LAE); Port Moresby subdistr., Owen Stanley Range, headwaters of Brown R., 1980 m, 16 July 1969 (fl), *Paijmans* 798 (CANB*, LAE). Milne Bay Distr.: Mt Dayman, Maneau [Maneao] Peak, 2780 m, 19 May 1953 (fl & fr), *Brass* 22251 (A, LAE*, MEL); Mt Maneao, 2250 m, 22 June 1956 (fl & fr), *Cruttwell* 746 (LAE).

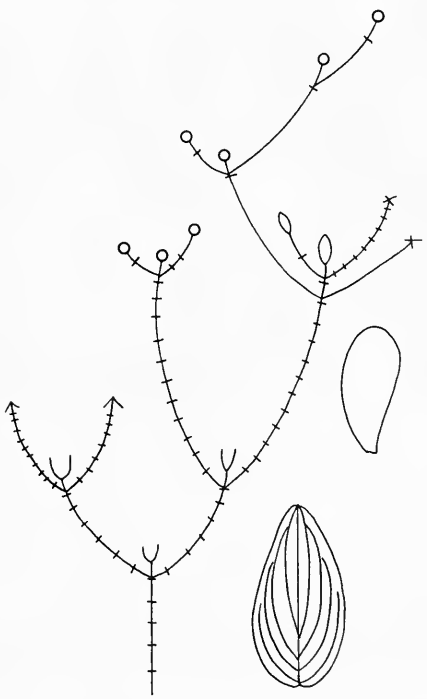
Most specimens have a leaf index of 2.5–3.5 and fruiting pedicels 2–6 mm long, but in the Mt Dayman (Milne Bay Distr.) population the leaves are broader (l. i. = 2.2–3.1) and the fruiting pedicels longer (5–10 mm). On the other hand, a population on the Mt Suckling complex (Central/Milne Bay border) has larger leaves with punctiform glands and other characters intermediate between *H. macgregorii* (or possibly *H. saruwagedicum*) and *H. papuanum* (e.g. Milne Bay Distr., Raba Raba subdistr., S. end of Goe Dendiwa, 3430 m, 25 June 1972 (fl & fr), *Stevens & Veldkamp* LAE 54269 (A, LAE). It seems likely that these are hybrids.

The complete absence of black glands is usually a good character to separate *H. macgregorii* from *H. saruwagedicum* (q.v.), and they apparently remain distinct where their areas overlap in eastern Papua. In one population from Mt Albert Edward (Central Distr.) – *Brass* 4168 (A, BM, BO, K, L, US), however, the gland pattern in different plants varies from mainly linear to mainly punctiform, thus forming a link between the two species.

4. **Hypericum bifurcatum** N. Robson in *Blumea* **20**: 256 (1973), in Steenis, *Fl. Males.* I, **8**: 22, ff. 15, 18d (1974); P. Royen, *Alpine Fl. New Guinea* **3**: 1474, f. 465 (1982). Type: New Guinea, Morobe District, Huon Peninsula, Cromwell Mts, Mannasat, *c.* 2340 m, 9 August 1964 (fl & fr), *Hoogland* 9542 (BM!-holotype; CANB!, K!, L!-isotypes; LAE).

Map 25.

Icon: P. Royen, *Alpine Fl. New Guinea* **3**: 1475, f. 465 (1982).



Shrub 0.3–1.5 m tall, with branches ± strict, pseudo-dichotomous and lateral, sometimes also basal and rooting. *Stems* 2–4-lined when young, eventually terete, eglandular. *Leaves* sessile; lamina 7–13(–17) × 1.5–6 mm, narrowly ovate to narrowly elliptic-oblong, concolorous, not glaucous, plane, ascending or appressed; apex rounded, base cuneate to rounded; venation: 3–4 pairs of main lateral veins, ± curved-parallel, scarcely branched except near apex and margin, without noticeable tertiary reticulation; laminar glands pale, linear to striiform, sometimes flanked by rows of dots, becoming ± interrupted towards apex and margin; intramarginal glands dense, pale. *Inflorescence* 1-flowered, with paired strong flowering branches in uppermost axils and often weaker ones in 1–2 axils immediately below, repeated pseudo-dichotomies giving an effect of bifurcations; pedicels 8–15 mm in fruit. *Flowers* 15–25 mm in diam., stellate; buds narrowly ovoid, rounded. *Sepals* 4–6(–7) × 1.5–2 mm, imbricate, equal, ovate-lanceolate, subacute, entire; veins 7, unbranched; laminar glands pale, all or mostly linear; inframarginal glands pale or reddish. *Petals* bright yellow, orange- to red-tinged dorsally, 9–14 × 3–5(–6) mm, 2.2–2.3 × sepals, obovate to oblanceolate, rounded, apiculus absent or almost so; laminar glands pale, linear, sometimes interrupted distally; marginal glands absent. *Stamens* not or obscurely 3-fascicled, *c.* 25–30, longest (5–)6–8 mm, *c.* 0.75 × petals; anther gland black. *Ovary* 2–3 × 1.5–2 mm, ovoid, acute; styles 3, 2–4 mm long, equalling or slightly longer than ovary, divergent; stigmas narrowly capitate; placentae 3, parietal except for axile extreme base. *Capsule* 6–9(–10) × 3.5–4.5 mm, *c.* 1.3 × sepals, ± broadly to narrowly ovoid or ovoid-pyramidal, with valves longitudinally vittate. *Seeds* yellow-brown, *c.* 0.7 mm long, slightly carinate; testa densely linear-foveolate.

Wet to dry alpine grassland; 1550–3000 m.

New Guinea (Terr. New Guinea – E. Highlands and Morobe Districts).

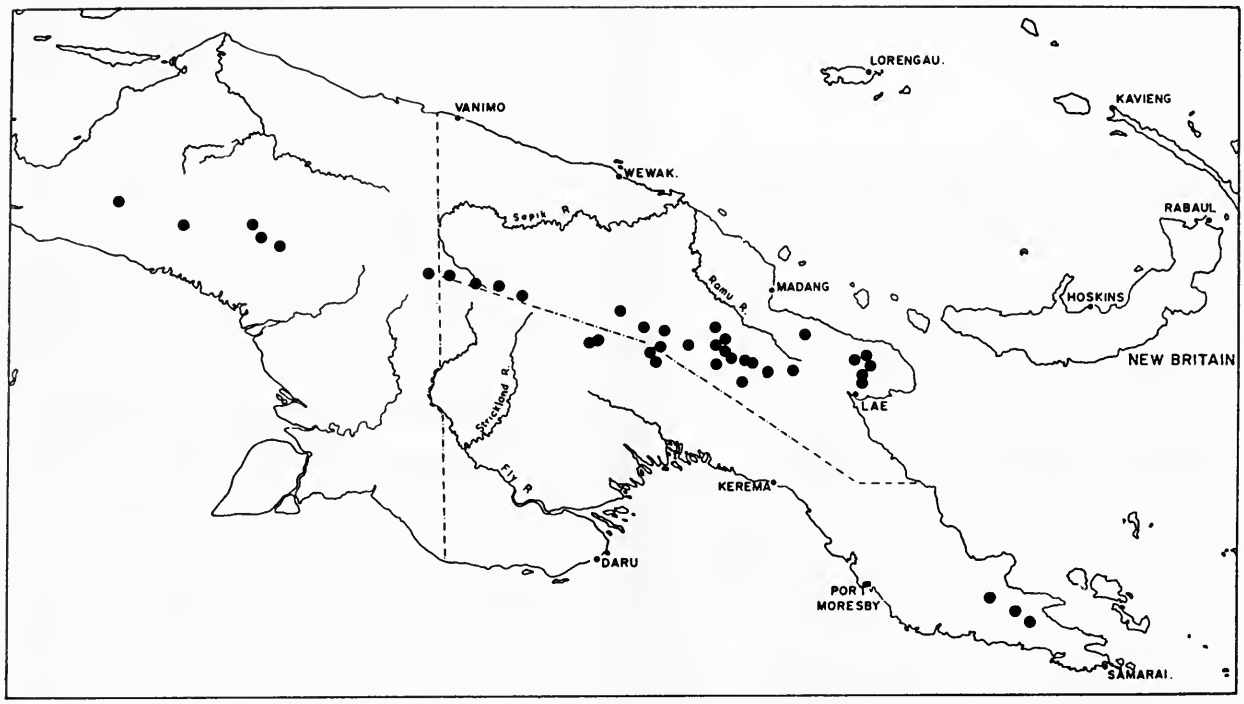
TERR. NEW GUINEA. Morobe Distr.: Mt Salawaket [Sarawaket], 3000 m, 20 January 1963 (fl & fr), *Hartley* 11166 (CANB, L, LAE*.); Busu R. and vicinity, 1800–2400 m, 12 May 1937 (fl & fr), *Clemens* 6268 (A, B). E. Highlands Distr.: Goroke subdistr., Marafunga, 3000 m, 29 August 1963 (fl & fr), *Millar & van Royen* NGF 15969 (CANB, L, SING); Chimbu Divide, Daulo Road Camp, 2400 m, 6 November 1954 (fl), *Womersley, Floyd & McKee* 6099 (A, K, LAE*).

The repeated pseudo-dichotomous inflorescence branching distinguishes *H. bifurcatum* from other members of sect. *Humifusoideum* except sometimes *H. papuanum*, which has a different pattern of leaf glands and often 4–5 styles. *H. macgregorii* rarely has one pseudo-dichotomy, but the leaves are smaller, the anther gland amber and the placentation axile. A collection of this species from a relatively low altitude (1500 m) in the Owen Stanley Range (Central Papua) is intermediate in this respect.

5. **Hypericum papuanum** Ridl. in *Trans. Linn. Soc.*, Bot. **9**: 19 (1916); Lauterb. in *Bot. Jb.* **58**: 5 (1922); Steenis in *Bull. Jard. bot. Buitenz.* **13**: 219 (1934); N. Robson in *Blumea* **20**: 257 (1973), in Steenis, *Fl. Males.* **8**: 22, ff. 17, 18c (1974); P. Royen, *Alpine Fl. New Guinea* **3**: 1469, f. 463 (1982); Steenis in *Blumea* **28**: 167 (1982). Types: Irian Jaya, Carstensz Peak, Camps 10–11, 1650–3300 m, 27 January 1913 (fl & fr), *Kloss* s.n. (BM!-lectotype, selected here; K!-syntype); Carstensz Peak, Camps 11–12, 28 January 1913 (fl & fr), *Kloss* s.n. (BM!-syntype).

Fig. 23B, Map 27.

H. japonicum sensu Warb. in *Bot. Jb.* **16**: 14 (1893).
H. macgregorii sensu Lauterb. in *Nova Guinea* **8**: 843 (1912).
H. hellwigii Lauterb. in *Bot. Jb.* **58**: 4 (1922); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Steenis in *Bull.*



Map 27 Sect. 26: 5. *H. papuanum* ●.

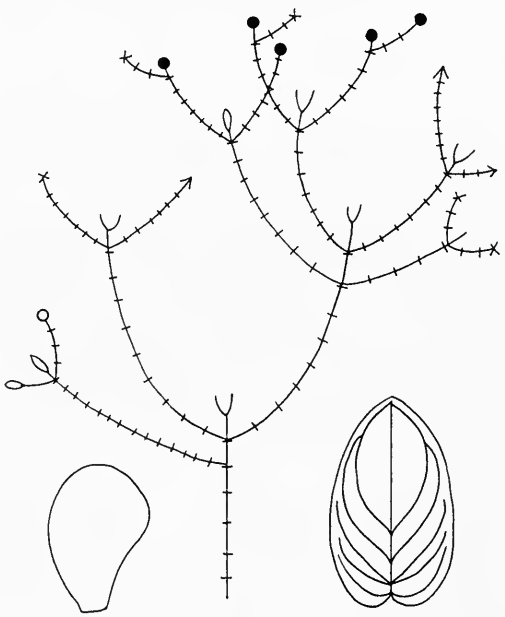
Jard. bot. Buitenz. III, **13**: 219 (1934). Types: New Guinea, Terr. New Guinea, Finisterre-Gebirge, *c.* 1200 m, 15 October 1888 (fl), *Hellwig* 336 (B†-lectotype, van Royen 1982 'holotype'; WRSL); Irian Jaya, Treub-Gebirge, 2100–2300 m, 25 October 1909 (fl), *van Nouhys* 7 (WRSL!-syntype); Irian Jaya, Hellwig-Gebirge, 2600 m, 2 December 1912 (fl), *Pulle* 594 (BO!-syntype); loc. cit., 3 January 1913 (fl & fr), *Pulle* 890 (BO, L!, WRSL-syntypes).

H. habbemense A.C. Sm. in *J. Arnold Arbor.* **22**: 343 (1941). Type: New Guinea, Irian Jaya, 9 km NE of Lake Habbema, 2600–2650 m, October 1938 (fl & fr), *Brass* 10865 (A!-holotype; BM!, BO!, L!, LAE-isotypes).

H. kunaianum Gilli in *Annln naturh. Mus. Wien* **83**: 440 (1980). Type: New Guinea, W. Highlands, Kuna Saw Mill bei Mt Hagen, 1900 m, Sommer 1970 (fl), *Dosedla* 76 (W!-holotype).

Icon: P. Royen, *Alpine Fl. New Guinea* **3**: 1471, f. 463 (1982).

Shrub or shrublet 0.1–1.3(–2) m tall, densely or more usually sparsely branched and ± spreading, with branches ascending, ± lax, creeping and rooting at the base. *Stems* 2–4-lined when young, eventually terete, eglandular. *Leaves* sessile or subsessile; lamina 6–25(–40) × 3–17 mm, narrowly to broadly ovate or ovate-triangular to elliptic or suborbicular, concolorous, not glaucous, plane, spreading or subimbricate-ascending; apex subacute (or rarely acute) to rounded, base rounded to cordate; venation: 4–5(6) pairs of main lateral veins, ± curved-parallel or divergent, much branched to form lax tertiary reticulation; laminar glands pale, linear towards base and distally striiform to punctiform or wholly striiform to punctiform; inframarginal glands dense, pale and/or black. *Inflorescence* 1-flowered, without or with flowering branches in uppermost axils, or regularly dichasial or mixed dichasial/pseudo-dichotomous; pedicels 4–20 mm in fruit. *Flowers* 18–26 mm in diam., stellate; buds ovoid to ellipsoid, subacute. *Sepals* 3–7(–8) × 1–2.5(–3.5) mm, imbricate, subequal to unequal, ovate to lanceolate or narrowly oblong or sometimes broadly ovate and foliaceous, acute to rounded, entire; veins 7–9, forking and distally branching; laminar glands pale,



linear; inframarginal glands black or absent. *Petals* bright yellow, not tinged red, 9–15 × 4–9 mm, 2–3 × sepals, narrowly obovate-elliptic, rounded, apiculus short or obsolete; laminar glands pale, wholly linear or distally striiform; marginal glands absent or few to numerous, black, often only in apiculus, not or scarcely prominent. *Stamens* not obviously fascicled, (15–)25–40(–50), longest 6–9 mm, *c.* 0.75 × petals; anther gland amber or occasionally black. *Ovary* (2–)2.5–3(–4) × 1.5–1.8 mm, narrowly or rarely broadly ovoid, acute; styles 3(4–6), 2–3(–4) mm long, 0.75–1 × ovary, divergent; stigmas narrowly to broadly capitate; placentae 3(4–6), parietal. *Capsule* (5–)7–9(–10) × 3–4.5 mm, 1.3 × sepals, narrowly or rarely broadly ovoid to ellipsoid, with valves longitudinally

vittate. *Seeds* yellow-brown to dark brown, 0.7–0.9 mm long, scarcely carinate; testa densely linear-foveolate to linear-scalariform.

Wet or more rarely dry alpine grassland and bogs, screes, abandoned cultivation; (1200–)1600–3800 m.

New Guinea (Irian Jaya (Mt Carstensz, Mt Hellwig, etc.) to Terr. New Guinea (Madang District) and Papua (Milne Bay District)).

IRIAN JAYA. Central Distr.: Wissel Lake region, S. border of Lake Paniai, foot of Mt Poti, February 1939 (fl & fr), *Eyma* 4531 (A, BM, BO, L, LAE*); Bale R., 18 km NE of Lake Habbema, 2200 m, November 1938 (fl & fr), *Brass* 11361 (A, BM, BO, K, L, LAE*). [Eastern Distr.?]: Mont. Hellwig, 2600 m, 3 January 1913 (fl), *Pulle* 890 (L).

TERR. NEW GUINEA. Sepik Distr.: Telefomin subdistr., Hindenburg Range, Mt Kaban, 3120 m, 7 January 1965 (fl), *Henty* NGF 20655 (L). W. Highlands Distr.: Wabag subdistr., N. slopes of Sugarloaf complex (along Wapu R.), 2850 m, 12 July 1960 (fl & fr), *Hoogland & Schodde* 7023 (A, BM, CANB*, L, LAE*, PNH, SING, Z); Hagen subdistr., *c.* 0.4 km SE of Tomba, *c.* 2400 m, 1 July 1957 (fl & fr), *Saunders* 649 (A, BM, CANB*, K, L, LAE*, MEL, US). E. Highlands Distr.: Goroka subdistr., near Yontegi village, between Dunantina R. and Karmanuntina R., *c.* 1850 m, 12 June 1956 (fl & fr), *Hoogland & Pullen* 5310 (A, BM, CANB*, K, L, LAE*, MEL, PNH, US); bottom of Mt Erimbari above Chuare, 2400 m, 26 January 1976 (fl), *Verdcourt & Johns* 4930 (BM, K). Morobe Distr.: Sarawaket Range, SW slope of Mt Enggom, along Zarun Creek, 2400 m, 24 February 1963 (fl & fr), *van Royen* NGF 16143 (CANB, K, L, SING); Sattelberg, Lambanga, 1500–1800 m, 14 September 1937 (fr), *Clemens* 7042a (A, B). Madang Distr.: Saidor subdistr., Naho-Rawa Divide, Sewe, L. Naho, 2700 m, 13 November 1964 (fl & fr), *Sayers* NGF 21419 (BM, L).

PAPUA. Northern Distr.: Mt Simpson, 2880 m, 28 October 1947 (fl & fr), *Cruttwell* 46 (K). S. Highlands Distr.: Mendi subdistr., W. slopes of Mt Giluwe above Klareg, *c.* 2640 m, 25 October 1961 (fl & fr), *Schodde* 1971 (CANB, K, L, LAE, PNH); Turi subdistr., Mt Ambua, 3490 m, 13 October 1966 (fl & fr), *Vink* 17433 (L, LAE). Milne Bay Distr.: Raba Raba subdistr., Mt Suckling complex, S. end of Goe Dendeniwa, 3430 m, 25 June 1972 (fl & fr), *Stevens & Veldkamp* LAE 54269 (A, CANB*, LAE); Maneau Peak, summit of Mt Dayman, 2780 m, 19 May 1953 (fl & fr), *Brass* 22244 (A, CANB, L, LAE*).

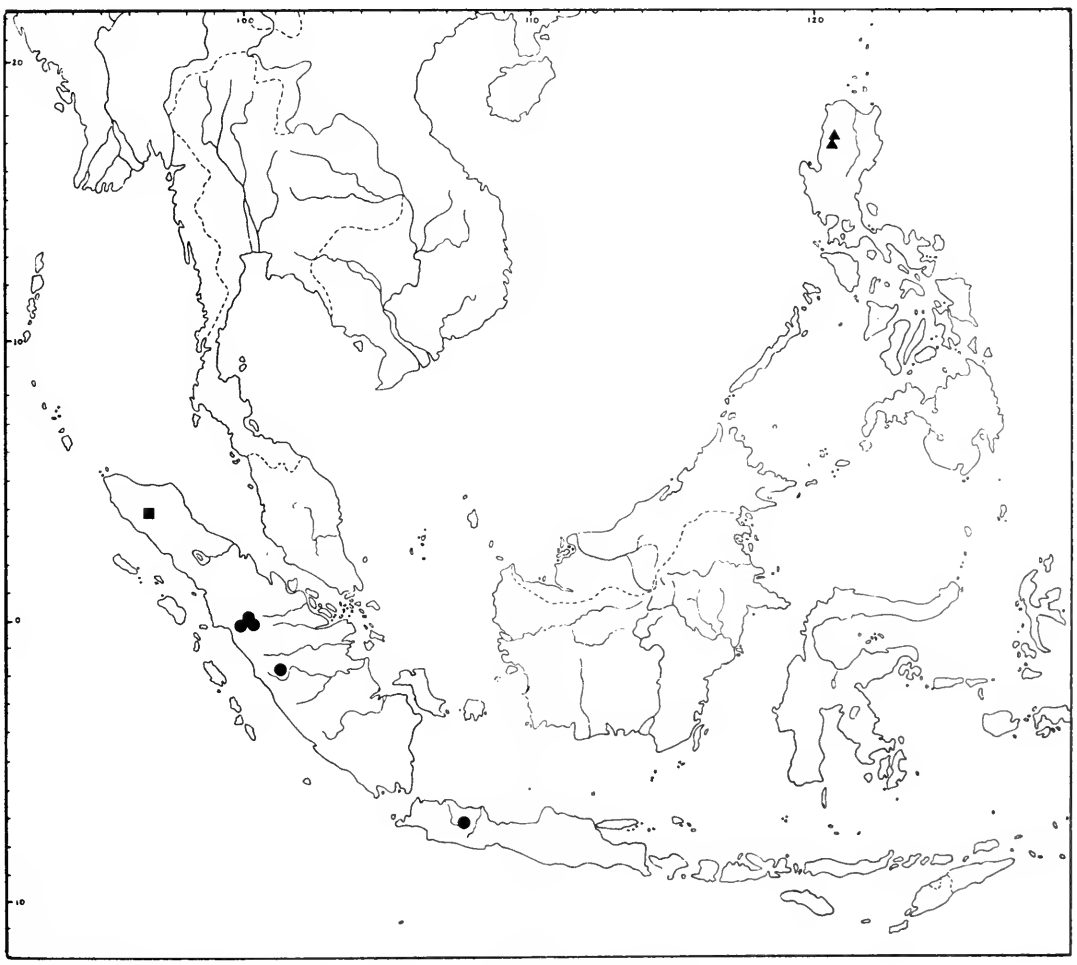
H. papuanum is a very variable species in which the extreme forms, although quite distinct in appearance, are linked by intermediates with varying combinations of characters, so that the morphological trends are not co-ordinated. These trends are:

(1) Leaves narrowly ovate and ± crowded, with laminar glands mostly linear (in E., W. and S. Highlands mainly) to broadly ovate or suborbicular, not crowded, with laminar glands all punctiform (constant in Irian Jaya and east Papua – Northern and Milne Bay Districts).

(2) Leaves, sepals, petals and anthers without black glands (mainly eastern) to with black glands, forming a continuous inframarginal row in the leaves (constant in Irian Jaya) and sepals and a continuous marginal row in the petals (rare).

(3) Inflorescence 1-flowered (mainly eastern) to regularly dichasial (mainly western).

(4) Styles and placentae 3, with ovary and capsule narrowly ovoid (mainly eastern) to styles and placentae 4–5 with ovary and capsule



Map 28 Sect. 26: 6. *H. pulogense* ▲; 7. *H. beccarii*: a. subsp. *beccarii* ●; b. subsp. *steenisii* ■.

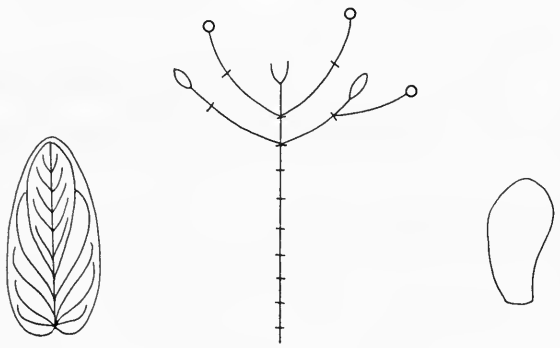
± broadly ovoid (mainly western). The occurrence of 6 styles and 5 placentae reported by A.C. Smith (1941) was not confirmed on examination of an isotype of *H. habbemense*. If correctly observed, this character combination was no doubt teratological in origin.

(5) Habit dense with ± ascending branches (widespread) to lax with ± spreading branches (Madang and Morobe Districts).

6. **Hypericum pulogense** Merr. in *Philipp. J. Sci.* **5**, Bot.: 364 (1910), *Enum. Philipp. fl. pl.* **3**: 75 1923); N. Robson in *Blumea* **20**: 259 (1973), in Steenis, *Fl. Males.* I, **8**: 24, f. 18a, b (1974). Types: Philippine Is, Luzon, Benguet Prov., Mt Pulog, January 1909 (fl & fr), *Curran, Merritt & Zschokke* Philipp. For. Bur. 16097 (US!-lectotype, selected here; BM!, L!, PNH†, US!-syntypes); Benguet Prov., Mt Pulog, May 1909 (fl), *Merrill* 6577 (K!, PNH†, US!-syntypes). Syntypes also include *McGregor* 8875 and 8880 (both PNH).

Map 28.

Icon: Steenis, *Fl. Males.* I, **8**: 23, f. 18a, b (1974).



Shrublet or woody herb 0.2–0.4 m tall, diffuse?, with branches erect or ascending to decumbent from slender branching rhizome. *Stems* 2(4–6)-lined or narrowly 2-winged when young, sometimes eventually terete, eglandular. *Leaves* sessile or very shortly petiolate; lamina 8–12(–20) × 3–7 mm, ovate to elliptic or oblong, glaucous beneath, plane (except margin?), spreading or ascending; apex obtuse to rounded, margin recurved (at least when dry), base broadly cuneate to rounded or subcordate; venation: *c.* 4 pairs of main lateral veins, divergent-incurved, slightly branched to form obscure tertiary reticulation; laminar glands pale, shortly striiform to punctiform, subprominent beneath; intramarginal glands dense, pale. *Inflorescence* 1-flowered, without or with flowering branches in uppermost axils, or 3–10-flowered and regularly dichasial; pedicels 4–6 mm in fruit. *Flowers* 20–25(–30) mm in diam., stellate; buds narrowly ovoid, subacute to obtuse. *Sepals* 4–6 × 1.8–2.4 mm, imbricate, equal to subequal, lanceolate to oblong or elliptic-oblong, apiculate to rounded, entire; veins 5, unbranched; laminar glands pale, linear to punctiform; inframarginal glands pale, dense or rather sparse. *Petals* bright yellow, not tinged red, 10–12(–14) × 4–6 mm, 2–2.5 × sepals, narrowly oblong-ovate, rounded, with apiculus small, glandular; laminar glands pale, numerous, basally linear, distally striiform to punctiform; marginal glands few?, pale. *Stamens* not obviously fascicled (5-fascicled *fide* Merrill), *c.* 30–60, longest *c.* 9 mm, *c.* 0.75 × petals; anther gland amber. *Ovary* 3–4 × 2 mm, ± broadly ovoid, obtuse; styles 3, *c.* 5–5.5 mm long, *c.* 1.5 × ovary, divergent; stigmas not or scarcely capitate; placentae 3, axile. *Capsule* 5–8 × 4–5 mm, narrowly to rather broadly ovoid, 1.3–1.5 × sepals, with valves longitudinally and diagonally vittate. *Seeds* yellow-brown to dark brown, 0.5–1 mm, not carinate; testa densely scalariform.

Summit grassland and open places in mossy forest; 2400–2800 m. (see Jacobs, 1972).

Philippine Islands (northern Luzon).

PHILIPPINES. Luzon: Mountain Prov., Mt Pulog, 2550–2650 m, 30 January 1968 (fl & fr), *Jacobs* 7231 (K, L); Mt Tabayoc, 2400–2500 m, 15 February 1968 (fl), *Jacobs* 7437 (K, L).

H. pulogense, which is known from only Mts Pulog and Tabayoc, is isolated morphologically as well as geographically. Having at first related it (correctly) to the *H. nagasawai* complex of Taiwan but in a distinct section, *Pulogensia* (Robson, 1973), I subsequently realized that it has affinities with the New Guinea members of sect. *Humifusoideum*, which it resembles in leaf and flower. The absence of black glands in it occurs also in some populations of its apparently nearest relative, 5. *H. papuanum* (q.v.), and the variation between pseudo-dichotomous and dichasial inflorescence branching also occurs in that species.

The Mt Tabayoc specimen has slender, more decumbent stems than those from Mt Pulog, and in those characters it approaches 7. *H. beccarii* from Sumatra and Java.

6(i). **Hypericum nagasawai** Hayata in *J. Coll. Sci. Univ. Tokyo* **30**(1): 38 (1911), *Icon. pl. Formos.* **1**: 81, t. 18 (1911); Makino & Nemoto, *Fl. Japan*: 543 (1925), 2nd ed.: 749 (1931); Sasaki, *List pl. Formosa*: 295 (1928); S. Susuki in Masamune, *Short fl. Formosa*: 141 (1936); Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 82, f.1 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 225, ff. 75, 76.1 (1951); N. Robson in Li et al., *Fl. Taiwan* **2**: 636, t. 431 (1976); Li X.-W. in *Fl. R. P. Sinicae* **50**(2): 70 (1990). Type: Taiwan, Chaiyi, Mt. Morrison [Alishan] ad 13094 ped. [3928 m] ['top of Mt. Yushan' on specimen], 2 November 1905 (fl), *Nagasawa* 754 (TI!-holotype).

Map 28a.

H. attenuatum sensu Hayata in *J. Coll. Sci. Imp. Univ. Tokyo* **25**(19): 59 (1908).

H. randaiense Hayata in *J. Coll. Sci. Imp. Univ. Tokyo* **30**(1): 39 (1911), *Icon. pl. formos.* **1**: 81, t. 17 (1911)); Makino & Nemoto, *Fl. Japan*: 295 (1925), 2nd ed.: 752 (1931); Sasaki, *List pl. Formosa*: 295 (1928); S. Susuki in Masamune, *Short fl. Formosa*: 141 (1936); Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 84, f. 2 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 226, f. 76.3 (1951). Type: Taiwan, Nantou, Randaisan [Luantashan], 8 August 1908 (fl), *Kawakami & Hayata* s.n. (TI!- holotype).

H. nagasawai var. *typicum* Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 82 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 225 (1951). Type as for *H. nagasawai*.

H. nagasawai var. *nigrum* Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 82, f. 1c (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 225 (1951). Type: Taiwan, Nantou, Prov. Taityû, inter Nôkô et Boarun, 16 June 1930 (fl), *Kudo & Mori* 2308A (TAI!-holotype).

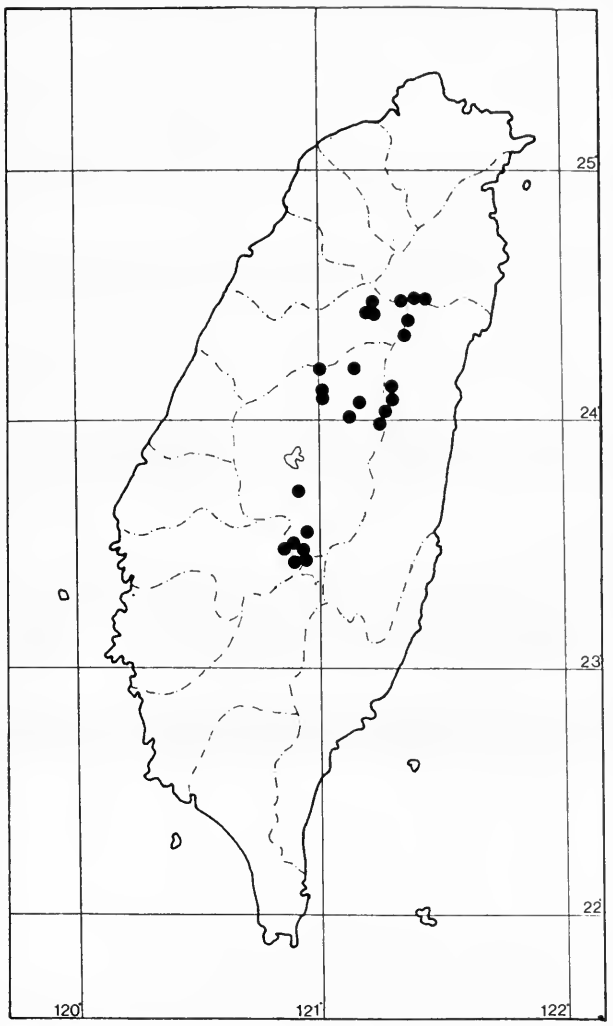
H. taiwanianum Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 84, f. 3 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 227, f. 76.6 (1951). Type: Taiwan, Taichung, Mt. Silvia [Tugitakayama], 3000 m, 13 July 1924 (fl), *S. Ohasi* in *Herb. Simada* 1214 (TI!- holotype).

H. hayatae Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 85, f. 5 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 228, f. 76.4 (1951). Type: Taiwan, Taichung, Hakku-taisan [Paikoutashan], 9 August 1908 (fl), *Mori* s.n. (TI!-holotype).

H. suzukianum Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 86, f. 6 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 228, f. 76.2 (1951). Type: Taiwan, Taichung, Prov. Taityû, Kunigigaoko [Kunugioko], 27 July 1936 (fl), *Suzuki* in HTU 118999 (TAI).

H. taiwanianum var. *taiwanianum* Y. Kimura in Nakai & Honda, *Nova fl. jap.* **10**: 227 (1951), autonym.

H. taiwanianum var. *ohwii* Y. Kimura in Nakai & Honda, *Nova fl.*



Map 28a Sect. 26: 6(i). *H. nagasawai* ●.

jap. **10**: 228 (1951). Type: Taiwan, Ilan, Painan-ambu, n.d. (fl), *S. Ohwi* s.n. (TI!- holotype).

Icones: Hayata, *Icon. pl. formos.* **1**: t. 18 (1911); N. Robson in Li et al., *Fl. Taiwan* **2**: t. 431 (1976).

Perennial herb or deciduous shrublet, 0.05–0.35 m tall, suberect to ascending from creeping branching rooting base, with stems solitary or ± caespitose, unbranched or ± branched above, wiry. *Stems* 2(4)-lined, eglandular; internodes *c.* 5–15 mm, shorter than leaves. *Leaves* sessile or subsessile; lamina (3–)8–25 × 3–12 mm, ovate or oblong to elliptic or oblanceolate or linear, glaucous or sometimes minutely papillose beneath, chartaceous to subcoriaceous; apex acute to rounded, margin entire, recurved, base cuneate to angustate; venation: 3–4 pairs of main laterals from lower third of midrib, sometimes forming ± marked submarginal vein, tertiary venation lax or obscure; laminar glands pale, somewhat elongate to punctiform, rather sparse, prominent above; intramarginal glands black, dense or irregular. *Inflorescence* 1–11-flowered from 1–2 nodes, sometimes with flowering branches from 1–2 nodes below, the whole subcorymbiform; pedicels 4–8 mm; bracts and bracteoles 2–6 mm long, lanceolate to linear, entire. *Flowers* 15–30 mm in diam., ± stellate; buds ovoid to ellipsoid, obtuse. *Sepals* 5, equal, 3–7.5 × 0.8–2.5 mm, in bud and fruit, ovate-lanceolate to ± narrowly oblong, obtuse to acute, entire or rarely with 1–2 glandular cilia; veins 5, outwardly branched; laminar glands pale or rarely black, striiform to punctiform or rarely linear; marginal glands black and sometimes pale, regular or irregular, immersed or rarely on cilia, or absent. *Petals* 5, bright yellow, not tinged red in bud, 8–17 × 4–7 mm, 2–2.5 × sepals, obovate or oblong–obovate to oblanceolate, usually entire, laminar glands pale and rarely black, linear to punctiform, or rarely absent, marginal glands black, sessile or occasionally on cilia, distal and few or subapical and solitary. *Stamens* 40–80, not or obscurely fascicled, longest 4.5–8 mm, 0.5–0.8 × petals; anther gland black. *Ovary* 3-locular, 2–2.5 × 1–1.5 mm, narrowly ovoid to ellipsoid-ovoid; styles 3, 3.5–7 mm, 1.3–3 × ovary, ± spreading from near base; stigmas narrowly or scarcely capitate. *Capsule* (5–)6–7 × 3.5–5 mm, *c.* 1.5 × sepals, narrowly to broadly ovoid; valves narrowly longitudinally vittate. *Seeds* dark brown, *c.* 1 mm, not or scarcely carinate, apiculate; testa finely scalariform-reticulate to linear-foveolate. 2n = 36 (n = 18, Hsu, 1968).

Stony or rocky slopes, roadsides and open areas of conifer forests and subalpine woodland; 2300–3997 m.

Taiwan (central mountains).

TAIWAN. Ilan: Chi-li-tin to Nanfu-shan-chuang, 21 August 1969 (fl), *Hsu* 5930 (TAI); in Mt. Nanko-taisan, July 1933 (fl), *Ohwi* 4095 (K). Hsinchu: Mt. Isawa, 18 July 1932 (fl), *Sasaki* in HTU 077131 (TAI); Mt. Taiha, on top, 5 July 1934 (fl), *Suzuki* in HTU 077087 (TAI). Taichung: Mt. Tugitaka, 19 August 1930 (fl), *Onuma* 12 (TAI); Souyuan-akou (Piyanan-ambu), S. slope of Mt. Layeh-wei-shan, 200–2300 m, 10 July 1963 (fl), *Shimizu & Chuang* 20142 (E). Nantou: southern flank of Yushan, 3860 m, 30 October 1992 (fl), *Kirkham & Flanagan* ETOT170 (K); Ten-tzu to Nen-kao, 12 August 1971 (fl), *Huang, Hsieh & Kao* 5825 (TAI). Chiayi: Arisan [Alishan], 2500 m, July 1914 (fl), *Faurie* 536 (BM); Pai-yunn Hostel to top of Mt. Morrison [Alishan], 3550–3997 m, 6 September 1969 (fl), *Hsu* 6283 (TAI). Hualien: Ko-Nan-Kuan, 16 July 1966 (fl), *Chuang & Kao* 4268 (TAI, US); from Tayn Lin to pass at Ko-nan Kuang, 3000 m, 8 August 1966 (fl), *van Steenis* 20700 (L).

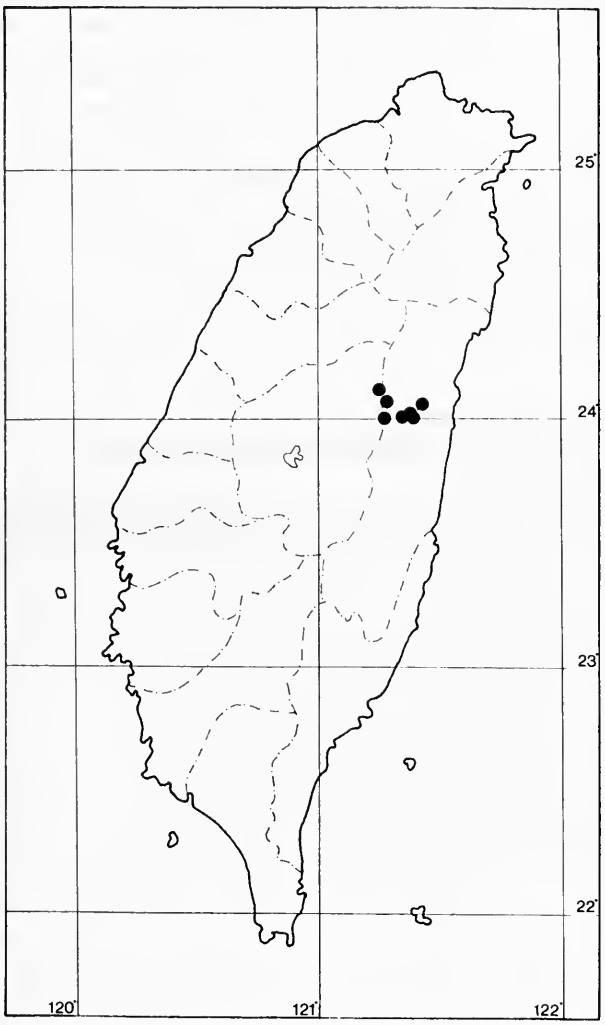
CULTIVATED. England: Kew, seed ex Formosa, *Yashiroda* 88, 16 August 1934 (fl), *Anon.* (K). Ireland: Co. Meath, Kells, I.F.S., cult. Marquess of Headfort, seed coll. Formosa ex *Yashiroda* 88, 13 August 1936 (fl), *Anon.* (K).

H. nagasawai is quite closely related to *H. pulogense*, differing from it *inter alia* by the more slender habit, the frequently narrower leaves and the black glands on the anthers and elsewhere. The variation from the mainly northern broad-leaved form with sepals and styles about 1.3 times as long as the ovary (*H. nagasawai*) to the southern narrow-leaved form with acute sepals and styles 2 or more times as long as the ovary (*H. randaiense*) appears to be continuous; and indeed the trends in leaf-form, sepal-shape and style-length are only partially correlated. It is not possible, therefore, to recognize *H. randaiense* as a distinct species. Similarly, plants described as *H. suzukianum* and *H. hayatae*, respectively, are more extreme forms of trends within *H. nagasawai*; and the occasional forms with black-glandular-ciliate sepal margins (*H. taiwanianum*) are linked to the more typical forms by specimens with one or two glandular cilia on each sepal margin.

6(ii). **H. nokoense** Ohwi in *Acta Phytotax. Geobot.* **6**: 48 (1937); Y. Kimura in *Bot. Mag. (Tokyo)* **54**: 85, f. 4 (1940), in Nakai & Honda, *Nova fl. jap.* **10**: 226, f. 76.5 (1951); N. Robson in Li et al., *Fl. Taiwan* **2**: 639 (1976); Li, X.-W. in *Fl. R. P. Sinicae* **50**(2): 69 (1990). Type: Taiwan, Hualien, Mt. Nôkôgoe, in Karenkô, June 1933 (fl), *Ohwi* 2951 (KYO-holotype); loc. cit., June 1933 (fl), *Ohwi* 2958 (K!, KYO, TI-paratype).

Map 28b.

Icon: Y. Kimura in Nakai & Honda, *Nova fl. jap.* **10**: 226, f. 76.5 (1951).



Map 28b Sect. 26: 6(ii). *H. nokoense* ●.

Perennial herb 0.05–0.1 m tall (sometimes longer and straggling), suberect to ascending from creeping, branching and rooting base, with stems ± caespitose, sometimes mat-forming, unbranched or ± branched above. *Stems* 2–4-lined or sometimes becoming almost terete, eglandular; internodes 2.4–6 mm, usually longer than leaves. *Leaves* sessile or with petiole up to 1 mm; lamina 4–12 × 1.5–6 mm, ovate (below inflorescence) to elliptic or narrowly oblong or obovate, markedly glaucous and sometimes minutely papillose beneath, subcoriaceous; apex rounded, margin entire, base cuneate-angustate; venation: 2–3 pairs of main laterals from lower 1/3 to 2/5 of midrib, tertiary reticulation obscure; laminar glands pale and sometimes black, punctiform, dense to sparse; intramarginal glands black, dense. *Inflorescence* 1–5(–7)-flowered, from apical node, without lower branches, subcorymbose; pedicels 1–1.5 mm; bracts and bracteoles 3–3.5 mm long, entire or with prominent marginal glands. *Flowers* 12–18 mm in diam., ± stellate; buds ovoid to ellipsoid, acute. *Sepals* 5, equal, erect in bud and fruit, 3–5 × 0.8–1.2 mm, lanceolate to narrowly oblong, acute to subacuminate, entire; veins 3–5, unbranched; laminar glands pale and black, linear to striiform; marginal glands black, irregular, submarginal. *Petals* 5, bright yellow, not tinged red in bud, 7–11 × 2–3(–4.5) mm, *c.* 3 × sepals, obovate or oblong-lanceolate to lanceolate, laminar glands pale and usually black, linear to punctiform, marginal glands absent. *Stamens* *c.* 40–43, obscurely '3'-fascicled, longest 5–8 mm, *c.* 0.7 × petals; anther gland black. *Ovary* 3-locular, *c.* 2 × 1 mm, ovoid?; styles 3, free, 4–6 mm, 2.5–3 × ovary, spreading from base; stigmas not enlarged. *Capsule* 6–7 × *c.* 4 mm, *c.* 1.5–2 × sepals, narrowly ovoid; valves longitudinally vittate. *Seeds* not seen.

Mountain slopes; 1800–1900 m.

Taiwan (Nantou, Hualien).

TAIWAN. Nantou: Sakahen to Kiraikei, 21 August 1929 (fl), *Sasaki* in HTU 077267 (TAI). Hualien: Mt. Luan-shan, 17 October 1967 (fl), *Huang* 4218 (TAI); Mt. Chin-shuei-shan, 21 June 1941 (fl), *Nakamura* 5355 (TAI).

No single character separates *H. nokoense* from *H. nagasawai* (from which it appears to have been derived by reduction); but the combination of small and relatively broad leaves, acute sepals usually with black laminar glands, and styles more than twice as long as the ovary appears to distinguish it. The leaf glands are not wholly black (*pace* Ohwi and Kimura).

7. **Hypericum beccarii** N. Robson in *Blumea* **20**: 260 (1973), in Steenis, *Fl. Males.* I, **8**: 25 (1974). Type: Sumatra, Barat, 'Padangsche Bovenland', G. Singgalan [Singalang] June–July 1878 (l. fl & fr), *Beccari* 337 (BM!-holotype; K!, L!, MEL!-isotypes).

Map 28.

H. japonicum var. *pinnatinervium* Bakh. f. in Backer & Backh. v. d. Brink, *Fl. Java* **1**: 382 (1963), nom. illegit. descr. angl. (Art. 36.1).

Perennial (or sometimes annual?) herb *c.* 0.02–0.45 m long, branching irregularly, wiry, with branches from near base, weak, decumbent or ascending (erect *fide* Bakh. f.), creeping and rooting. *Stems* 4–6-lined when young, often becoming 2-lined, eglandular. *Leaves* with petiole 0.2–1.5 mm long; lamina 2.5–10.5 × 0.5–6 mm, broadly oblong or elliptic-oblong to oblanceolate or linear, glaucous beneath, plane (sometimes except margin), spreading; apex subacute or apiculate to rounded, margin not or slightly recurved, base rounded to cuneate; venation: 3(4) pairs of main lateral veins, ± parallel-incurved, branched to form tertiary reticulation dense and conspicuous near apex and margin; laminar glands pale, irregularly punctiform; intramarginal to marginal glands irregular, pale and/or black. *Inflorescence* 1-flowered, with flowering branches in one or both uppermost axils; pedicels (2–)5–17 mm in fruit. *Flowers* *c.* 7–10 mm in diam., stellate; buds narrowly ovoid, obtuse. *Sepals* 2.5–5 × 0.6–1.4 mm, imbricate or not, unequal to equal, elliptic-oblong to linear, rounded to apiculate or subacute, entire to irregularly glandular-ciliate; veins 5, branching and reticulating; laminar glands pale, shortly striiform to punctiform; inframarginal to marginal glands black, spaced. *Petals* yellow, not tinged red, 3–7 × 2–2.5 mm, 1.2–1.4 × sepals, oblong-oblanceolate, rounded, with apiculus glandular or glandular-ciliate; laminar glands pale or black, few, near apex, punctiform, or absent; marginal glands black, 1–2, subsessile or on cilia, sometimes continuing as a row of inframarginal to submarginal glands. *Stamens* clearly (?) 3-fascicled, *c.* 15–22, longest 2.5–5.5 mm, *c.* 0.75–0.85 × petals; anther gland black. *Ovary* 1.5 × *c.* 1 mm, ± narrowly ovoid, acute; styles 3, *c.* 1.5 mm long, placentae 3, axile. *Capsule* 3–5.5 × 2–3.5 mm, ± narrowly ovoid, 1.3–1.2 × sepals, with valves longitudinally vittate or almost smooth. *Seeds* reddish brown, 0.7–0.9 mm, not carinate; testa densely and shallowly linear-reticulate.

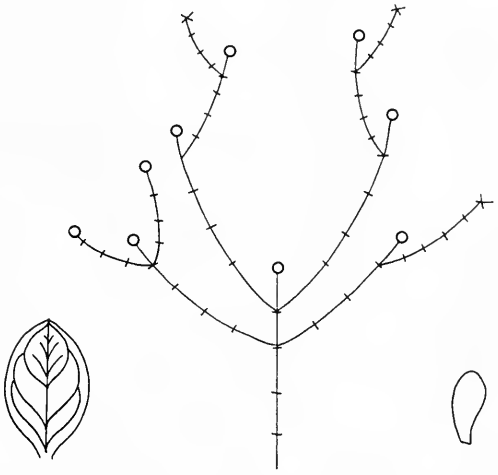
Damp places in open vegetation; 1800–3000 m.

Sumatra (N., W.-central), Java (W.).

H. beccarii is more closely related to 5. *H. papuanum* than to 6. *H.*

pulogense, in particular to the small, more diffuse form from Irian Jaya (which includes the type). The most primitive characters occur in the central Sumatran populations on G. Talamau and G. Singalang, those on Java (on G. Papandajan only) and northern Sumatra being dwarfer with a cuneate leaf base. The northern Sumatran population, which also differs in its narrower leaves and almost smooth capsules, is worthy of distinction as a subspecies.

7a. **Hypericum beccarii** subsp. **beccarii**



Leaves with petiole 0.2–1 mm long; lamina 4–10 × 2–6 mm, broadly oblong or elliptic-oblong to narrowly obovate; apex rounded-apiculate to rounded, base rounded to cuneate; laminar glands ± prominent. *Sepals* 3.5–5 × 1–3 mm, ± broadly imbricate. *Petals* 5–7 mm long; laminar glands (when present) black. *Stamens c.* 20–22, longest 4.5–5.5 mm. *Capsule* 4–5.5 × 2.5–3.5 mm, densely and prominently vittate.

1500–3000 m.

Sumatra (W.-central, on GG. Singalang, Talang, Talamau and Kerintji), Java (G. Papandajan).

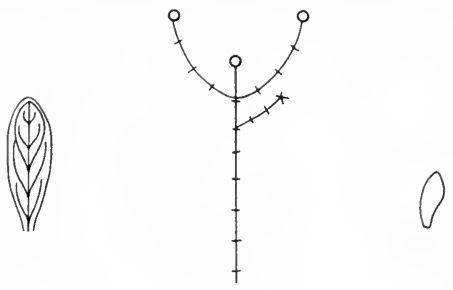
SUMATRA. Jambi: Talang, Taloe, 1500 m, 15 June 1917 (fl & fr), *Bunnemeijer* 1050a (BO); Talamau, NW slope, 2700 m, 25 May 1917 (fl & fr), *Bunnemeijer* 843 (BO). Barat: G. Koerintji, 2400 m, 10 May 1920 (fl), *Bunnemeijer* 10398 (BO); G. Indrapura, 3000 m, 11 January 1914 (fl), *Matthew* s.n. (K).

JAVA. Priangan: G. Papandajan, *c.* 2450 m, 21 January 1930 (fl & fr), *van Steenis* 4080 (L).

Specimens with broad leaves and large flowers (from G. Talamau and G. Singalang) approach *H. papuanum* most closely. The Javan and G. Indrapura populations are dwarfer with smaller, cuneate-base leaves, relatively shorter pedicels and sepals more often with glandular cilia, but they cannot otherwise be separated from those further north.

7b. **Hypericum beccarii** subsp. **steenisii** N. Robson in *Blumea* **20**: 261 (1973), in Steenis, *Fl. Males.* I, **8**: 25 (1974). Type: Sumatra, Gaju and Alas Lands, Mt Losir, bivouac 4 to 5, 2700–2800 m, 31 January 1937 (fl & fr), *van Steenis* 8514 (L!-holotype; A!, K!-isotypes).

Leaves with petiole 0.5–1.5 mm; lamina 2.5–10.5 × 0.5–4 mm, oblanceolate to linear; apex rounded to subacute, base cuneate; laminar glands not prominent. *Sepals* 2.5–5 × 0.6–1.4 mm, not imbricate. *Petals* 3–6 mm long; laminar glands (when present) pale. *Stamens c.* 15–20, longest 2.5–4.5 mm. *Capsule* 3–4.5 × 2–3 mm, sparsely and obscurely vittate (almost smooth).



Along streamlets in open vegetation; 2700–3314 m.

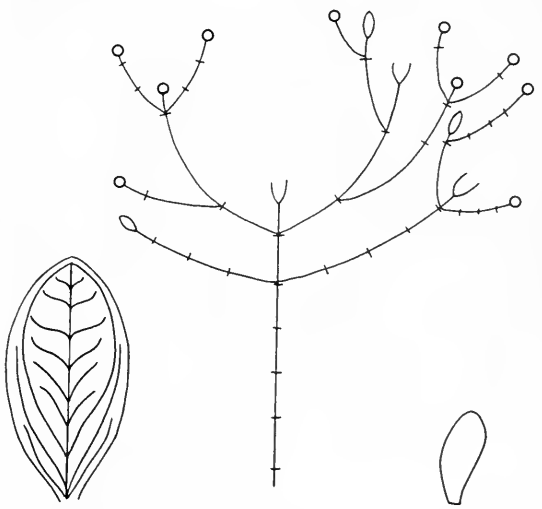
Sumatra (N.).

SUMATRA. Aceh: Gunung Leuser National Reserve, between and below G. Leuser West top and Middle top, 3200 m, 10 April 1975 (fl), *de Wilde & deWilde-Duyfjes* 16325 (K); Gajo Lands, G. Kemiri, E. side, bivouac 2 near top, 3100–3314 m, 7 March 1937 (fl), *van Steenis* 9599 (L).

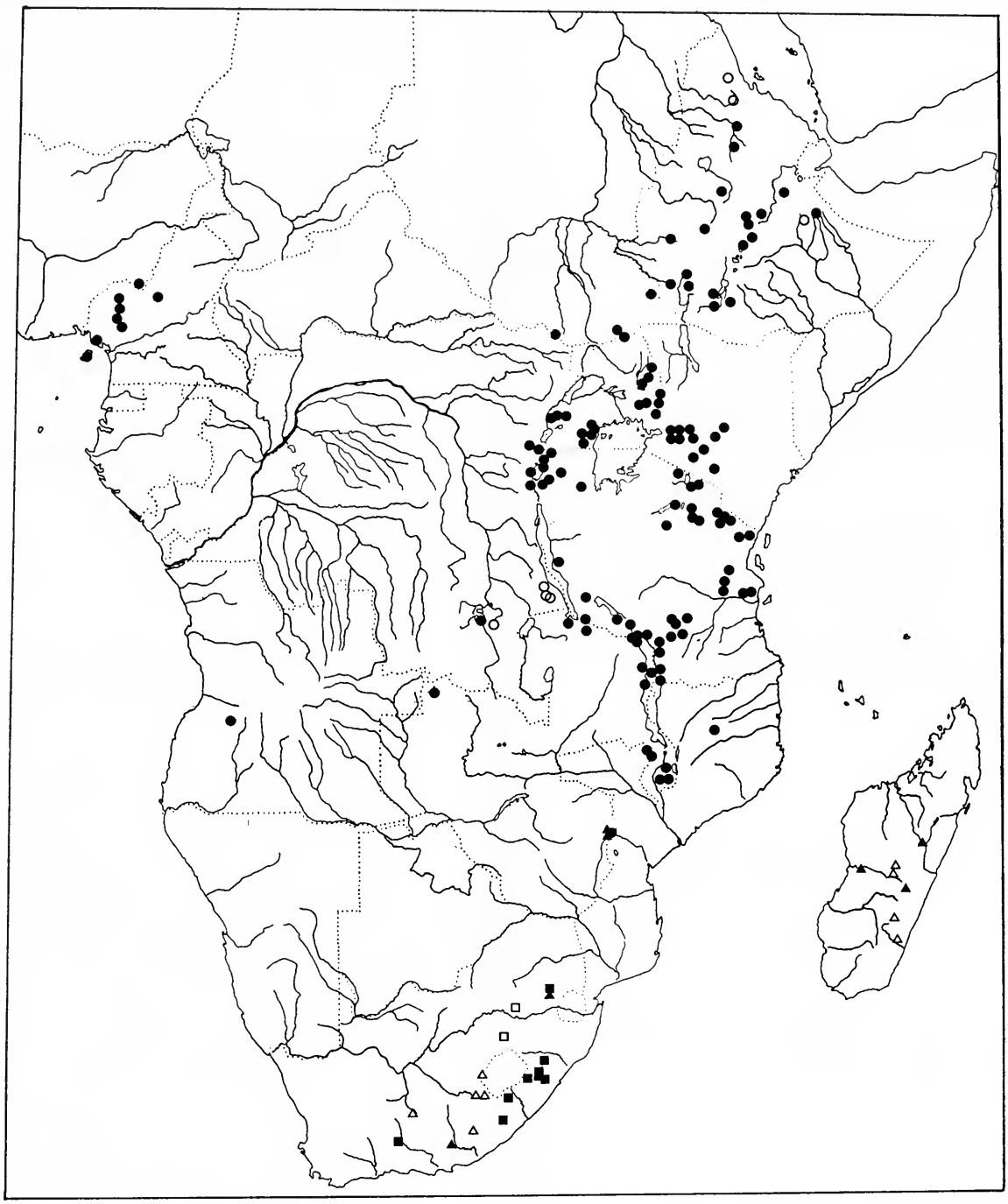
8. **Hypericum natalense** J.M. Wood & M.S. Evans in *J. Bot. Lond.* **35**: 487 (1897); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 177 (1925); Burtt Davy, *Man. pl. Transvaal* **1**: 25 (1926); Bredell in *Bothalia* **3**: 579 & map (1939); N. Robson in *Kew Bull.* **12**: 440, map 2 (1958); Killick & Robson in *Fl. southn Afr.* **22**: 19 (1976). Type: Natal, Estcourt District, near bank of Mooi river, 1200–1500 m, 26 October 1888 (fl & fr), *Wood* 4034 (NH-holotype; BM!, BOL, G, K!, Z!-isotypes; PRE-photograph). Fig. 24A, Map 29.

H. woodii R. Keller in *Bot. Jb.* **58**: 193 (1923), in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925). Type: Natal, near bank of Mooi river, 1200 m, 26 October 1888 (fl & fr), *Wood* NH 788 (B†-holotype). Keller's type is from the same collection as that of Wood & Evans.

H. natalense var. *petiolatum* Bredell in *Bothalia* **3**: 580 (1939). Type: Natal, Camperdown District, no precise locality, *Franks* NH 12968 (NH-holotype; PRE-photograph).



Perennial woody herb 0.2–0.45 m tall, fasciculate, with branches 1-many from underground rootstock, erect, much branched. *Stems* 4-lined and ancipitous when young, soon terete, eglandular. *Leaves* sessile or rarely to 0.5 mm petiolate; lamina 9–20 × 5–12 mm, broadly elliptic to obovate, paler but not glaucous beneath, plane, spreading; apex obtuse to rounded, base cuneate to rounded; venation: 1–3 pairs of main lateral veins, much branched to form fairly



Map 29 Sect. 26. 8. *H. natalense* ■ specimens, □ records; 9. *H. wilmsii* ▲ specimens, △ records; 10. *H. peplidifolium* ● specimens, ○ records.

conspicuous tertiary reticulation; laminar glands pale, punctiform; intramarginal glands spaced, black. *Inflorescence* 1-flowered, with (usually) paired flowering branches from 1–2 or more (up to 10) nodes below; pedicels 4–10 mm in fruit. *Flowers c.* 10–14 mm in diam., stellate; buds ellipsoid, obtuse. *Sepals* 4–8 × 1.5–4 mm, imbricate, unequal, elliptic to obovate or spathulate, rounded-subapiculate to rounded, entire; veins 5, branched and reticulating; laminar glands pale, dense, shortly striiform to punctiform; inframarginal glands few, mostly subapical, black. *Petals* yellow, not tinged red, 6.4–7 × 1.7–2.5 mm, *c.* 0.9–1.5 × sepals, elliptic to oblong or spathulate, rounded, apiculus subterminal, obscure to obsolete; laminar glands few, pale or absent; marginal glands absent or few, black, near apex. *Stamens* irregularly 3-fascicled or not fascicled, *c.* 30, longest 3–5 mm, *c.* 0.5–0.7 × petals; anther gland black. *Ovary* 2.5–3 × 2 mm, ovoid-cylindric, obtuse; styles 3–4(5), 2–2.5 mm long, 0.8–0.9 × ovary; stigmas narrowly capitate; placentae axile. *Capsule* 5–6 × 3 mm, ovoid-cylindric, 1.25–1.35 × sepals, with valves longitudinally vittate. *Seeds* yellow-brown, 0.7–0.9 mm, not carinate; testa scalariform-reticulate.

Damp places in grassland; 300–1650 m.

Eastern Transvaal, Swaziland, Natal (Midlands), eastern Cape Province.

Fig. 24 A. *H. natalense*: (a) habit; (b) leaf; (c) sepal; (d) petal; (e) capsule. B. *H. wilmsii*: (f) habit; (g) capsule; (h) sepal. C. *H. peplidifolium*: (i) habit; (j) *sepal;*(k) petal; (l) 'berry' (a, f, i × ½; b × 2; e, h, l × 4; c, d. g, j, k × 5). A. *Medley Wood* 6251. B *Exell, Mendonça & Wild* 124. C. *Newman & Whitmore* 19.

TRANSVAAL. Pilgrim's Rest Distr., Mac Mac, pre-July 1884 (fl), *Mudd* s.n. (K).

SWAZILAND. Mbabane, Poliniane R., *Compton* 26489 (NBG*).[8]

NATAL. Pietermaritzburg Distr., mountain top before Hela Hela, 2 November 1969 (l. fl), *Strey* 9221 (K); Pietermaritzburg Distr., Howick [Falls], 300 m, 1893 (fl), *Junod* 217 (Z); Umvoti Distr., Greytown, 968 m, October–November 1931 (fl), *Wylie* s.n. (K); Houtbosh, 1875–1880 (fl), *Rehmann* 6306 (Z); Estcourt Distr. (see type); Mpendhle Distr., Litani area, Elandshoek Valley, 1650 m, 26 December 1984 (fl & fr), *Hilliard & Burtt* 1804 (K).

CAPE PROVINCE. Griqualand, Mt Fletcher Distr., Mt Fletcher, November 1913 (fl), *Jacottet & Jacottet* 570 (Z); Tsolo Distr., *Payne* 14 (GRA*); Umtata Distr., Baziya, 600 m, pre 1885 (fl & fr), *Baur* 582pp. (K); Kentani Distr., October, *Pegler* 117 (GRA*).

H. natalense is related to 4. *H. bifurcatum*, differing from it in being less woody with stems more branched basally and laterally, so that there are lateral branches bearing repeated pseudo-dichotomies from usually several lower stem nodes. In addition, the leaves are thinner and spreading and the leaf laminar glands are punctiform, not linear. Despite the wide geographical separation, however, there can be no doubt of the close relationship of these two species.

9. **Hypericum wilmsii** R. Keller in *Bull. Herb. Boissier* II, **8**: 179 (1908) in clav., in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 181 (1925); Bredell in *Bothalia* **3**: 579 (1939); N. Robson in *Kew Bull.* **12**: 440, map 2 (1958), in Exell & Wild, *Fl. Zamb.* **1**: 383 (1961); Killick & Robson in J. Ross, *Fl. southn Afr.* **22**: 20 (1976). Type: Transvaal, Lydenburg District, bei der Stadt Lydenburg, January 1888 (fr), *Wilms* 136 (W!-holotype; PRE!, fragment).

Fig. 24B, Map 29.

H. rupestre sensu H. Perrier in *Archs Bot. Bull. mens.* **1**: 9, 11 (1927) pro parte quoad descr., nec Jaub. & Spach (1842) nec Bojer ex R. Keller (1925).

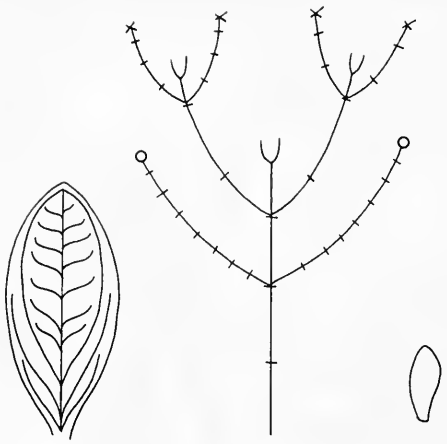
H. nigropunctatum Norl. in *Bot. Notiser* **1934**: 103, t. 8 (1934). Type: Zimbabwe, Inyanga, *c.* 3 km occidentum versus a monte Inyangani, *c.* 1900 m, 8 December 1930 (fl & fr), *Fries, Norlindh & Weimarck* 3634 (LD!-holotype; BM!, PRE!, SRGH!-isotypes; K!-photograph).

H. bojerianum sensu H. Perrier in *Not. Syst. Paris* **13**: 269 (1948), in *Mém. Inst. scient. Madagascar* **1**: 113 (1949), in Humbert, *Fl. Madag.*, Hypéric.: 4, f. I 14–17 (1951), pro parte omnes excl. typum. See Robson (1958: 440).

H. aethiopicum sensu Jacot Guill., *Fl. Lesotho*: 211 (1971) (as *H. aethiopicum* subsp. *sonderi*) pro parte?, see p. 169.

Icon: Humbert, *Fl. Madag.*, Hypéric.: 5, f. I 14–17 (1951).

Perennial herb, 0.06–0.2 m tall, spreading or straggling, with branches ± numerous from taproot, decumbent or ascending, branched, sometimes rooting. *Stems* 2-lined and ± ancipitous above, otherwise terete, eglandular or densely black-gland-dotted. *Leaves* with petiole to 2 mm long or rarely almost sessile; lamina (3–)6–10 × 2–7 mm, ovate or elliptic to obovate or suborbicular, plane spreading; apex rounded, margin slightly recurved, base rounded to cuneate; venation: 2–4 pairs of main lateral veins, branching to form dense inconspicuous tertiary reticulation; laminar glands pale, punctiform; inframarginal glands dense, all or mostly black. *Inflorescence* 1-flowered, with paired flowering branches from uppermost and sometimes next lower nodes; pedicels 3–10 mm, erect in fruit. *Flowers* 9–12 mm in diam.; buds ellipsoid, obtuse. *Sepals* 4–7 × 1–2 mm, imbricate, unequal, all oblong or outer ones obovate, obtuse



or apiculate to rounded, entire; veins 3, branched and reticulating; laminar glands pale, punctiform; inframarginal glands numerous to few, black or rarely absent. *Petals* bright to primrose yellow, occasionally tinged red, 5–9 × 2–3.5 mm, *c.* 1.3 × sepals, oblong to obovate, apiculus subterminal, obscure; laminar glands pale or rarely some black streaks; marginal glands sparse, black, near apex. *Stamens* irregularly 3–4-fascicled or not fascicled, 18–30, longest *c.* 4–6 mm, *c.* 0.7 × petals; anther gland black. *Ovary* 2.5–4 × 2 mm, obtuse; styles 3–4, (1.5–)2–2.5 mm long, *c.* 0.65 × ovary, divergent; stigmas narrowly capitate; placentae 3–4, axile. *Capsule* 5–6 × 3–5 mm, ellipsoid, 0.8–0.9 × sepals, erect, with valves longitudinally vittate. *Seeds* yellowish brown, 1–1.5 mm, not carinate; testa linear-foveolate.

Damp places and on mountain slopes; 1200–2000 m (Zimbabwe), 1200–1500 m (South Africa), 1200–2500 m (Madagascar).

Zimbabwe (E.), Transvaal, Orange Free State, Lesotho?, eastern Cape Province, Madagascar.

ZIMBABWE. Eastern: Umtali Distr., Emgwa, 1980 m, 2 February 1955 (fl & fr), *Exell, Mendonça & Wild* 124 (BM, SRGH); Umtali Distr., Himalayas, Banti North, 1950 m, 4 March 1964 (fr), *Wild* 4519 (K, SRGH); Inyanga Distr., N. side of Pungwe Gorge, 3 February 1957 (fl & fr), *Seagrief* CAH 1026 (K, SRGH*).

TRANSVAAL. Lydenburg Distr. (see type of *H. wilmsii*).

ORANGE FREE STATE. Bloemfontein, Thaba Mchu, *Roberts* 2350 (PRE*).

LESOTHO (see below). Mafeteng Distr.: Likiele, Mt Ha-moya-pela, 6 January 1916, *Dieterlen* 1222 (PRE*); Catai R., Ha-Ma-Khonofane, *Dieterlen* 1293 (PRE*).

CAPE PROVINCE. Herschel, Majubanek, near Sterkspruit, December, *Hepburn* 92 (GRA*). Aliwal North: Doctor's Drift, 1233 m, 8 December 1933, *Gerstner* 137 (PRE p.p.*); Elandshoek, *c.* 1356 m, October, *Bolus* 153 (PRE*, SAM*). Queenstown: no precise locality, 1200–1500 m, November–December (fl), *Galpin* 1629 (PRE*). Somerset East: Cradock Distr., Mt Zebra Park, 13 November 1953, *Brynard* 291 (PRE*); Somerset East, 6 March 1866 (fl & fr), *Bolus* 319 (K, TCD*).

MADAGASCAR. Centre (mountains to S. of Imerina): Ankaratra au N. de Antsirabe, *Perrier* 14626 (P*); Betafo, a l'W. de Antsirabe, *Perrier* 3467 (P*); S. Betsileo, environs d'Ambalavao, *Perrier* 14625 (P*); massif d'Andringitra, au S. d'Ambalavao, *Perrier* 3663 (P*).

H. wilmsii is intermediate in form and distribution between 8. *H. natalense* and 10. *H. peplidifolium*, occurring to the west and north of the former and the south and east of the latter. In habitat it is near *H. peplidifolium*, but the capsule is dry, dehiscent and usually erect. The exceptional characters (black-glandular stem, black-striped petals, recurved fruiting pedicels) are all found only in Zimbabwe. The leaves of the Madagascar plants tend to be relatively broader than those on the mainland.

[8] An asterisk (*) after records of South African specimens of sect. *Humifusoideum* indicates that they have been seen by Killick but not by me.

Jacot Guillarmot (1971) did not include *H. wilmsii* in her *Flora of Lesotho*, re-identifying most of Bredell's records as *H. aethiopicum*; but Killick cites them as *H. wilmsii* without comment.

10. **Hypericum peplidifolium** A. Rich., *Tent. fl. abyss.* **1**: 9 (1847); Oliv., *Fl. trop. Afr.* **1**: 155 (1868); Engl., *Pflanzenw. Ost.-Afr.* **C**: 274 (1895), in Mildbr., *Deutsch Zentr.-Afr. Exped.* 1907-1908 **2**: 560 (1913); De Wild., *Pl. Bequaert.* **1**: 242 (1922), **5**: 404 (1932); Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 177 (1925); Staner in *Revue Zool. Bot. afr.* **23**: 221 (1933), **24**: 218 (1933), in *Bull. Jard. bot. État Brux.* **13**: 68 (1934); Norl. in *Bot. Notiser* **1934**: 101 (1934); Robyns, *Fl. Sperm. Parc Nat. Albert* **1**: 618 (1948); Andrews, *Fl. Anglo-Egyptian Sudan* **1**: 212 (1950); Exell & Mendonça, *Consp. Fl. Angol.* **1**: 370 (1951); Milne-Redh., *Fl. trop. E. Afr.* Hyperic.: 9 (1953); Hutch. & Dalz., *Fl. W. trop. Afr.* 2nd ed. (ed. Keay) **1**: 287 (1954); N. Robson in *Kew Bull.* **12**: 443, 445, map 2 (1958), in Exell & Wild, *Fl. Zamb.* **1**: 383. t. 73C (1961); Cufod. in *Bull. Jard. bot. État Brux.* **29**: Suppl.: 588 (1959); Spirlet, *Contr. Fl. Congo, Rwanda, Burundi*, Guttiferae: 4 (1966); Moggi & Pisacchi in *Webbia* **22**: 264, f. 9, map 5 (1967); Bamps in Boutique, *Fl. Congo, Rwanda, Burundi* Guttiferae: 3 (1970), in *Bull. Jard. bot. natn. Belge* **41**: 433 (1971), in *Distr. Afr. Pl.* **3**: map 67 (1971); Agnew, *Upland Kenya Wild Fls*: 187 & f. (1974); Robson in Bamps, Robson & Verdcourt, *Fl. trop. E. Afr.* Guttiferae: 31 (1978); Troupin, *Fl. Rwanda* **1**: 299, f. 63–3 (1978). Type: Ethiopia, 'Abyssinia', *Quartin-Dillon & Petit* s.n. (P-lectotype, Moggi & Pisacchi, 1967).

Fig. 24C, Map 29.

H. peplidifolium var. *robustum* Baker f. in *Trans. Linn. Soc. London*, II (Bot.) **4**: 6 (1864). Types: Malawi, Mt Milangi [Mlanje], October 1891 (fl & fr), *Whyte* 143 (BM!-lectotype, selected here; K!-isotype); Mt Milanji, September 1891 (fl), *Whyte* s.n. (BM!-syntype).

H. peplidifolium forma *ovatum* Engl. in *Bot Jb.* **19**, Beibl. 47: 40 (1894). Types: Tanzania, Kilimanjaro, Marangu, 1550 m, *Volkens* 697 (B†-syntype), *Volkens* 698 (B†-syntype); Usambara Mts, Mlalo, *Holst* 47 (B†-syntype); Usambara Mts, Lutindi, *Holst* 3266 (B†-syntype).

H. peplidifolium forma *parvifolium* Engl. in *Bot. Jb.* **19**, Beibl. 47: 40 (1894), *Pflanzenw. Ost-Afr.* **C**: 274 (1895) ['*parvifolia*']; Chiov. in L.A. Savoia-Aosta, *Espl. Uaba-Uebi Sceb.*: 389 (1932). Types: Tanzania, Kilimanjaro, Marangu, 2000-2500 m, *Volkens* 829 (B†-syntype); Kisinika [Kifinika], 2800 m, *Volkens* 1157 (B†-lectotype, selected here; BM!, K!-isolectotypes). The BM and K specimens of this number are said to have come from Mawenzi at 3000 m.

H. peplidifolium var. *oblongifolium* Engl. in *Bot. Jb.* **19**, Beibl. 47: 40 (1894); *Pflanzenw. Ost-Afr.* **C**: 274 (1895). Type: Tanzania, Kilimanjaro, Kibo, 3100 m, *Volkens* 1545 (B†-holotype; BM!, K!-isotypes).

H. peplidifolium var. *ovatum* (Engl.) Engl., *Pflanzenw. Ost-Afr.* **C**: 274 (1895) ['*ovata*'], in *Annali Ist. Bot. Roma* **7**: 20 (1898).

H. peplidifolium forma *robustum* (Baker f.) Engl., *Pflanzenw. Ost-Afr.* **C**: 274 (1895) ['*robusta*'].

H. peplidifolium var. *diestelianum* Engl. in *Bot. Jb.* **40**: 555 (1908). Type: Cameroon, Cameroons Mtn, Buea, *Diestel* s.n. (B†-holotype).

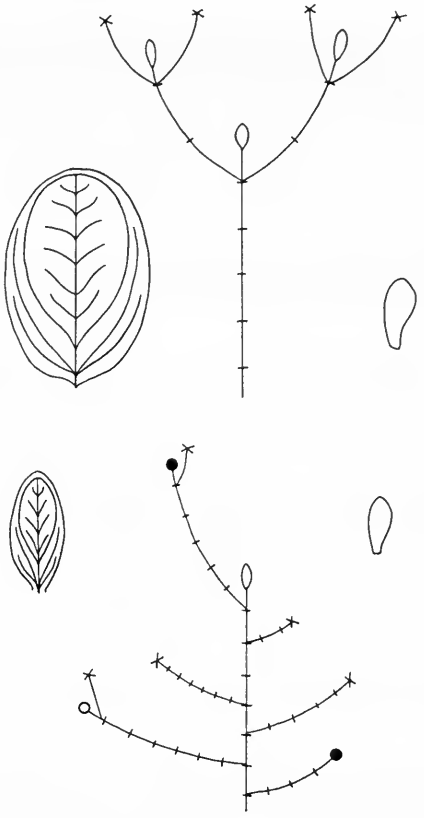
H. peplidifolium var. *ovatum* forma *humile* Riva in sched. ['*humilis*'] (cf. Moggi & Pisacchi, 1967: 264).

H. peplidifolium var. *anagallidifolium* Chiov. in sched. (cf. Moggi & Pisacchi, 1967: 264).

H. sp. C. sensu Milne Redh., *Fl. trop. E. Afr.* Hyperic.: 13 (1953).

H. humbertii sensu Spirlet, *Contr. Fl. Congo, Rwanda, Burundi*, Guttiferae: 5 (1966) pro parte quoad. spec. *Troupin* 2669 (*fide* Bamps, 1970: 3).

Icones: Moggi & Pisacchi in *Webbia* **22**: 265, f. 9 (1967); Agnew, *Upland Kenya Wild Fls*: 187 (1974).



Perennial herb, wiry or rarely woody, up to 0.6(-0.9) m tall but often much less, 0.1-0.9 m in diam., tufted, with branches ascending to prostrate, sometimes rooting at proximal nodes or budding from horizontal roots, rather slender. *Stems* wholly terete or sometimes slightly 2-lined above, eglandular or (in S. of range) black-gland-dotted. *Leaves* with petiole 0.5-1.5 mm long; lamina 3-26 × 2-20 mm, ovate to elliptic or obovate or rarely suborbicular, spreading; apex rounded to obtuse, margin plane, base rounded to cuneate; venation: 2-3 pairs of main lateral veins, branching to form rather inconspicuous tertiary reticulation; laminar glands pale and sometimes a few black, punctiform; intramarginal glands dense, black. *Inflorescence* 1-flowered, terminal, often with 1 or 2 flowering branches from uppermost 1(2) nodes, branching rarely repeatedly pseudo-dichotomous; pedicels 4-40 mm long, reflexed in fruit. *Flowers* 8-15 mm in diam.; buds ovoid to ellipsoid, obtuse. *Sepals* 4-5 × 3-4 mm, imbricate, very unequal, the inner ones narrower, obovate to elliptic or oblong or lanceolate, obtuse or apiculate to rounded, entire; veins 3, branching and reticulating; laminar glands pale and occasionally some black, punctiform; inframarginal glands dense, all or mostly black. *Petals* bright to primrose yellow, often tinged red, 7-8(-14) × 2-4 mm, *c.* 1.7 × sepals, obovate; laminar glands pale or very rarely also black; marginal glands round most of margin, black, sometimes also submarginal. *Stamens* obscurely 3(4-5)-fascicled or irregular, 20-40(-60), longest 5-6 mm, *c.* 0.75 × petals; anther gland black. *Ovary* 2.4-3 × 1.4-1.9 mm, ovoid to broadly ellipsoid, acute to obtuse; styles 5(4), 2.5-4 mm long, *c.*

1-1.3 × ovary, divergent; stigmas scarcely capitate; placentae 5(4), axile. *'Capsule'* bacciform, indehiscent, 6-11 × 5-9 mm, *c.* 2 × sepals, broadly ovoid to subglobose, smooth. *Seeds* yellowish brown, 0.6-0.8(-1) mm, not carinate; testa finely reticulate-scalariform. 2n = 16 (I. & O. Hedberg, 1977).

Marshes, swamps, streamsides, roadsides, pastures, temporary leys and abandoned cultivation in upland and moorland grassland; 1100-3750 m (W., NE and E. tropical Africa), 600-2350 m (S. tropical Africa).

Cameroon, Fernando Poo, Ethiopia, Sudan Republic, Zaire, Rwanda, Burundi, Uganda, Kenya, Tanzania, Malawi, Zambia, Mozambique, Zimbabwe and Angola.

CAMEROON. Adamawa: Mambela Distr., Ngel Nyaki, 1650 m, 20 January 1958 (fl & fr), *Hepper* 2811 (K); Bamenda, Bambalue Forest Reserve, 2100 m, 3 September 1952 (fl), *Savory* UCI 400 (K); Cameroon Mtn, S. side, Mann's Spring, 2190 m, 25 March 1947 (fl), *P.W. Richards* 9521 (K).

EQUATORIAL GUINEA. Fernando Poo: Moka [Mioka], 1500 m, 27 September 1959 (fl & fr), *F. Melville* 689 (K).

ETHIOPIA. Arssi: Galama Mts, *c.* 30 km ESE of Asella, *c.* 3 km E. of Boraluco, Chillalo Awraja, 3750 m, 7 September 1967 (fl), *Hedberg* 4194 (K). Bale: Dincho, 3120 m, 17 April 1970 (fl), *Gilbert* 1781 (EA, K). Eritrea: Hamasan, Asmara and Taclesan, 5 May 1892, *Terraciano & Pappi* 285 (FI). Gammu-Gofa: Cencia, 16 March 1938 (st), *Vatova* 2073 p.p. (FI). Gojjam: Choké Mts, vicinity of upper Ghiedeb valley, near N. peak, Arnt Makereke, *c.* 3600 m, 14 August 1957 (fl), *Evans & Hellier* in *Camb. U. Bot. Exped.* 529 (K). Gondar: Simien Mts, Geech area, 3500 m, 4 September 1968 (fl), *B. & E. Nievergelt* 1166 (EA). Hararghe: *c.* 50 km due W. of Harar, NW face of Gara Mullata Mtn, 2500-3000 m, 14 February 1962 (fl), *Burger* 1472 (K). Illubabor: just outside Gore on Mettu road, *c.* 1900 m, 7 December 1970 (fl & fr), *Danish Bot. Exped. 1970* 590 (C*, K). Keffa: *c.* 15 km NW of Bonga on Wush-Wush road, *c.* 1800 m, 17 August 1965 (fl & fr), *de Wilde* 7775 (K, WAG*). Shoa: Entoto Hill, just N. of Addis Ababa, 2650 m, 28 November 1972 (fl & fr), *Danish Bot. Exped. 1972-73* 1382 (C*, K). Sidamo: Garbicho, near Wondo, 2400 m, 31 January 1954 (fl & fr), *Mooney* 5677 (K). Tigray: am Rand der Äker, 1650-2400 m, 10 October 1862 (fr), *Schimper* 544 (BM, K, Z).

SUDAN REPUBLIC. Equatoria: Imatong Mts, Gilo, 1800 m, 29 June 1947 (fl), *MacLeay* 117 (BM).

KENYA. Turkana: W. Suk, Kapenguria, 2100 m, 13 May 1932 (fl & fr), *Napier* 1927 (K). Rift Valley: Nakuru Distr., Eastern Mau Forest Reserve, camp 10, 2650 m, 1 September 1949 (fl), *Maas Geesteranus* 6016 (K, Z). Central: Mt Kenya, N. sector, 2850 m, 30 July 1949 (fl & fr), *Schelpe* 2476 (BM). Nzanza: Trans-Nzoia Distr., Mt Elgon, 3360 m, 24 February 1935 (fl), *Taylor* 3660 (BM). Southern: Narok Distr., Masailand, Oldevesi Lemoko, *c.* 72 km N. of Aitong, *c.* 2070 m, 28 April 1961 (fl & fr), *Glover, Gwynne & Samuel* 812 (K).

UGANDA. Northern: Karamoja Distr., Moroto Mtn, 2550 m, January 1959 (fl), *Wilson* 650 (K). Western: Toro Distr., Fort Portal, the fort, 1525 m, 12 May 1953 (fl & fr), *Osmaston* 2899 (K); Kigezi Distr., Kabale-Bufundi road, 2100 m, 12 October 1929 (fl), *Snowden* 1502 (BM, K). Eastern: Bugishu Distr., Sipi, 1650 m, 30 August 1932 (fl & fr), *Thomas* 397 (K). Buganda: Masaka Distr., Minzilo, 30 October 1925 (fl), *Maitland* 1197 (K).

ZAIRE. Lacs Edouard et Kivu: Rutshuru, mont Katale, December 1937 (fl & fr), *Lebrun* 9185 (BR*, K, P*); Ruanoli - Lamia ridge, 2700 m, 5 August 1952 (fl), *Ross* 852 (BM). Lac Albert: Nioka, 1800 m, 4 July 1946 (fl), *Taton* 130 (BM, BR*, K); mont Korovi, 2100 m, 24 June 1958 (fl & fr), *Bamps* 231 (BR*, K). Haut-Katanga: Parc National de l'Upemba, Lusinga, *de Witte* 5012 (BR*); Marungu Mts, environs de Kasiki, r. Lunangwa, 2300 m, February 1970, *Lissowski, Malaisse & Symoens* 10666 (EBV*).

RWANDA. Cyangugu: Kirambo, R. Karunduru, Rangiro, forêt de Nyungwe, 1600 m, 13 June 1978 (fl), *Raynal* 20524 (BM, P*); Ruhengeri, Mushas, *Zappelli* 38 (BR*).

BURUNDI. Muramoya, Nyabiagondo, 2100 m, 21 January 1966 (fl & fr), *Lewalle* 305 (BM, BR*, K); Ngozi, *Becquet* 867 (BR*).

TANZANIA. Lake: Ngara, Bushubi, Kaza, 1500 m, 15 May 1960 (fl), *Tanner* 4987 (K). Northern: Kilimandjaro-Süd, *c.* 1800 m, 12 January 1934 (fl & fr), *Schlieben* 4530 (BM, K, Z); Arusha Distr., Ngurdoto Crater National Park, Leopard Point, 1620 m, 19 March 1966 (fl & fr), *Greenway & Kanuri* 12440 (K). Tanga: W. Usambaras, Lushoto – Shume road, Magamba forest, 1800 m, 1 March 1953 (fl & fr), *Drummond & Hemsley* 1362 (K). Western: Sumbawanga Distr., Rukwa Escarpment, Nsangu, *c.* 2000 m, 2 January 1962 (fl), *Robinson* 4872 (K). Eastern: Morogoro Distr., Mgeta, Kibuko, March 1955 (fl), *Semsei* 2043 (K). Southern Highlands: Mbeya Distr., Mbeya Mtn, 2100 m, 13 December 1962 (fl & fr), *M. Richards* 17012 (K); Kyimbila Distr., 1350 m, August 1910 (fl), *Stolz* 263 (K, LU, Z). Southern: Songea Distr., Matengo Hills, Miyau, 1620 m, 2 March 1956 (fl & fr), *Milne-Redhead & Taylor* 8941 (K); Ungwe-Thal, 1300 m, 25 November 1931 (fl), *Schlieben* 1452 (BM, Z).

MALAWI. Northern: Nyika Plateau, Lake Kaulime, 2150 m, 24 October 1958 (fl & fr), *Robson* 338 (BM, K); Vipya, Chikangawa, 22 January 1956 (fl), *Chapman* 358 (BM). Central: Dedza Mtn, 23 October 1956 (fl & fr), *Banda* 291 (BM, SRGH). South: Shire Highlands, Ndurandi, December 1893 (fl & fr), *Scott-Elliot* 8483 (BM, K); Mt Mlanje, W. Tuchila, 1800 m, 6 July 1956 (fl & fr), *Newman & Whitmore* 19 (BM, K).

MOZAMBIQUE. Zambézia: Gúruè, sopé do pico Namuli, 24 September 1944 (fl), *Mendonça* 2257 (BM, LISJC).

ZIMBABWE. Eastern: Inyanga, Trias Hill, December 1919 (fl & fr), *Philomene* in *Eyles* 5181 (K, SRGH); Inyanga prope villam Inyanga Down in convalle prope flumen Tranga, *c.* 1800 m, 30 January 1931 (fr), *Norlindh & Weimarck* 4732 (BM, LU); Rhodes Inyanga Estate, 16–20 November 1931 (fl), *Brain* 6917 (K, SRGH).

ZAMBIA. Northern: Abercorn [Mbala], Lake Chila, 29 December 1954 (fl), *M. Richards* 3786 (K). Eastern: Nyika Plateau, *c.* 4 km from [N. Rhodesian] Rest House, 2100 m, 22 October 1958 (fr), *Robson* 267 (BM, K). Western: Mwinilunga, 17 November 1937 (fl & fr), *Milne-Redhead* 3283 (K).

ANGOLA. Benguela: Ganda, *c.* 1300 m, November 1937 (fl), *Pittard* 99 (BM).

H. peplidifolium is variable in habit and in size of parts, but none of the named infraspecific taxa is worthy of recognition. The tallest plants with rather woody, ascending stems occur in the southern part of its area (Malawi, Zimbabwe, Mozambique), and the tendency towards 4 rather than 5 styles is greater there, too. Indeed, *Mendonça* 2257 (Mozambique, Zambézia) varies towards *H. natalense*, whereas *Brain* 6917 (Zimbabwe) has 4 styles and varies towards *H. wilmsii*. In general, however, the bacciform fruit on reflexed pedicels will distinguish *H. peplidifolium* from its nearest relatives.

Just as *H. wilmsii* has eglandular stems in South Africa and black-gland-dotted stems in Zimbabwe, so *H. peplidifolium* has black-gland-dotted stems in Mozambique and Zimbabwe and eglandular stems elsewhere. A similar character change is found in *H. aethiopicum* (sect. 27. *Adenosepalum*, p. 180). The significance of this concentration of gland-dotted stems in the Zimbabwe-Transvaal region is unclear to me.

Sect. 27. **ADENOSEPALUM** Spach in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836).

Shrubs, shrublets or wiry to soft herbs up to 2.5 m tall, deciduous when woody, glabrous or with simple hairs, with dark (black) glands nearly always on leaves (sometimes all pale in Sp. 15), usually on sepals and anthers and sometimes on petals and stems (black or rarely red); branching below inflorescence lateral. *Stems* 4-lined and ± ancipitous or 2-lined at first or wholly terete, eglandular or rarely red- or black-gland-dotted; cortex exfoliating in strips or sheets; bark smooth and finely striate, sometimes flaking irregularly. *Leaves* opposite or very rarely and abnormally 3-whorled, decussate, sessile or rarely very shortly petiolate, free, deciduous at base or persistent; lamina entire or rarely undulate to serrulate with prominent glands, with venation pinnate, open (laterals ending freely) or ± closed (upper or all laterals incurved and uniting), with tertiary venation ± densely reticulate; laminar glands punctiform; marginal gland-dots

dense or rarely ± sparse; ventral glands absent. *Inflorescence* 1–*c.* 200-flowered, with branching dichasial (first node) then monochasial, from 1–8 nodes often with subsidiary branches from lower nodes; bracts and bracteoles reduced, transitional in form to sepals. *Flowers* stellate, homostylous. *Sepals* 5, free or up to *c.* 0.2 united, persistent, erect in fruit, with margin subentire to glandular-denticulate or -ciliate; veins 3–7; laminar glands pale and/or black, linear to punctiform; marginal and/or inframarginal glands black, when marginal often flat-topped. *Petals* 5, persistent and twisting together round developing capsule or occasionally separately, with apiculus present, subapical or apical, acute to apiculate, or absent, margin with ± prominent glands or entire; marginal glands black or absent; laminar glands pale, linear to punctiform and/or black, punctiform to elongate-punctiform. *Stamen fascicles* 5, united 2+2+1 (i.e. '3') or rarely 2+1+1+1 (i.e. '4') but sometimes indistinct, persistent, totalling *c.* 20–70 stamens; filaments united very shortly; anthers yellow, gland black or very rarely amber; pollen types I, X. *Ovary* with 3 loosely to completely axile placentae, each ¥-ovulate; styles 3(4), free with bases discrete; stigmas scarcely capitate or usually small. *Capsule* 3(4)-valved, subcoriaceous to chartaceous, with valves narrowly longitudinally vittate. *Seeds* narrowly cylindric, not or scarcely carinate, with apical expansion; testa almost smooth or shallowly linear-reticulate to linear-foveolate or finely scalariform.

BASIC CHROMOSOME NUMBERS (X). 10, 9, 8; ploidy 2, 4.

HABITAT. Among rocks (often calcareous) or scrub, open grassland, along streams, in marshes or wet ground; sea level to 2400 m (Europe, Mediterranean, NW Africa, Macaronesia), 1800–3000 m (SW Arabia, NE Africa), 1100–3900 m (E. Africa), 2000 m (Angola), 135–1850 m (SE Africa).

DISTRIBUTION. Canary Is., Madeira; Europe N. to N. England and S. Norway, E. to S. Finland, Poland, Byelorussia; Ukraine; Georgia and NE Turkey; SW Turkey, Cyprus and the Levant; N. Africa and adjacent Arabia, Ahoggar Mts; NE Africa and adjacent Arabia (Asir); E. and SE Africa; Angola.

24 species (+ 3 subspecies and 2 hybrids).

Key to sects 27. *Adenosepalum* and 28. *Elodes*

1 Plant completely glabrous 2

Plant with indumentum on at least young stem or leaves 13

2(1) Bracts and bracteoles densely glandular-auriculate 3

Bracts and bracteoles without gland-fringed auricles 4

3(2) Inflorescence curved-pyramidal or corymbiform to capitate, all or at least partial inflorescences dense; stem and lamina of leaves and sepals without black glands ..... 17. **montanum**

Inflorescence broadly pyramidal to subcorymbiform, lax; stem and lamina of leaves and/or sepals with black glands ..... 18b. **annulatum** subsp. **intermedium**

4(2) Plant a shrub with leaves triangular-lanceolate, acute to subacute, ± deeply cordate-amplexicaul ..... 16. **reflexum**[9]

Plant a shrub with leaves not having this combination of characters or a subshrub or herb 5

5(4) Plant a low herb with stems weak, decumbent or diffuse; sepals obtuse to rounded 6

Plant a shrub or subshrub or herb with stems wiry, erect to decumbent; sepals aristate or acute to rounded (subsect. 1. *Aethiopica*) 7

6(5) Sepals with pale and black laminar glands ..... 22. **cuisinii**

Sepals with only pale laminar glands ..... 23. **lanuginosum**

7(5) Leaves (20–)30–60 mm long, the base narrowly cuneate to angustate, almost always with prominent marginal black glands; shrub, straggling to spreading below ..... 1. **glandulosum**

Leaves 6–20(–30) mm long, the base ± broadly cuneate to cordate with immersed submarginal black glands; shrubs (rarely) or subshrubs or herbs 8

8(7) Leaf apex acute to obtuse; plant a subshrub to 0.4 m with stem branched; inflorescence dense ..... 2. **abilianum**

Leaf apex rounded or, if subacute to obtuse, then plant a herb branched at base, usually without stem branches; inflorescence ± lax 9

9(8) Petals with only marginal black glands; stem eglandular, ± branched; shrubs or subshrubs or suffruticose herbs 10

Petals with laminar as well as marginal black glands; stem often black-gland-dotted, usually unbranched; perennial herb, sometimes with woody base (6. **aethiopicum**) 12

10(9) Sepals entire to subentire with marginal black glands, 4.5–8 mm long; inflorescence 1–*c.* 25- flowered from 1–3 nodes 11

Sepals black-glandular-denticulate to -ciliate, 3–3.5 mm long; inflorescence *c.* 60-flowered from 3–4 nodes ..... 5. **afrum**

11(10) Leaves with base rounded to cordate-amplexicaul, sessile, (5–)7–22 mm wide, margin undulate; slender erect shrub or subshrub with branches ± strict ..... 3. **conjungens**

Leaves with base cuneate to rounded, usually shortly petiolate, 2.5–7(–8) mm wide, margin plane; ± spreading much-branched shrub with branches usually ± ascending ..... 4. **kiboënse**

12(9) Stems black (rarely amber)-gland-dotted; sepals entire to subentire with marginal glands immersed to prominent ..... 6a. **aethiopicum** subsp. **sonderi**

Stems eglandular; sepals with margin distally or wholly black-glandular-denticulate to -ciliate ..... 6b. **aethiopicum** subsp. **aethiopicum**

13(1) Bracts and bracteoles entire to regularly glandular-ciliate but without auricles, or if glandular-auriculate then leaf pairs connate .. 14

Bracts and bracteoles densely glandular-auriculate or with crowded longer-stalked glands at base; leaf pairs free (subsect. 4. *Adenosepalum* excl. Sp. 16) 25

14(13) Plant a shrub; stem tomentose to puberulous; leaves glabrous or rarely villous-pilose 15

Plant a perennial herb; stem and leaves both with indumentum 16

15(14) Leaves glabrous, entire, base cordate to rounded; stem densely villous-tomentose ..... 16. **reflexum**

Leaves villous-pilose and/or with protruding marginal glands and/or base cuneate; stem glabrous or ± densely villous-tomentose ..... 1x. × **joerstadii**

16(14) Flowers pseudo-tubular; stamen filaments in each fascicle *c.* 0.65 united; sepal marginal glands reddish (sect. 28. *Elodes*) ..... 1. **elodes**

Flowers stellate; stamen filaments in each fascicle basally united; sepal marginal glands black 17

17(16) Leaf pairs free; inflorescence usually lax (subsect. *Pubescentes*) 18

Leaf pairs all or mostly connate; inflorescence ± congested (subsect. *Caprifolia*) 23

[9] See also lead 15.

18(17) Sepals (dorsally) and inflorescence branches villous or tomentose 19

Sepals and upper parts of inflorescence (at least above bracteoles) glabrous 20

19(18) Sepals 5–10 mm long, linear-lanceolate to lanceolate, apex long-(usually eglandular-) aristate, margin entire to subentire ..... 7. **pubescens**

Sepals 3–5(–6) mm long, lanceolate to ovate or broadly elliptic, apex acute to shortly aristate and usually glandular, margin with prominent sessile glands or glandular cilia ..... 9. **tomentosum**[10]

20(18) Stem spreading to appressed-puberulous; leaves papilliform-puberulous ..... 8. **psilophytum**

Stem pubescent to tomentose with spreading hairs; leaves pubescent to tomentose 21

21(20) Sepals and petals with only pale laminar glands ... 10. **somaliense**

Sepals and petals usually with some black laminar glands 22

22(21) Stems erect, not rooting; leaves triangular-lanceolate to narrowly oblong, at least lower condensed-tetrastichous; flowers *c.* 25 mm in diam. ..... 11. **collenettiae**

Stems ascending to prostrate, sometimes rooting; leaves narrowly oblong to elliptic or oblanceolate, neither condensed nor manifestly tetrastichous; flowers 9–13 mm in diam. ..... 12. **sinaicum**

23(17) Sepals acute to subacuminate, mostly oblong to elliptic, marginal glands sessile or some on very short cilia 24

Sepals aristate, narrowly lanceolate, with marginal glands all on short to long cilia or fimbriae ..... 15. **caprifolium**

24(23) Leaves broadly elliptic to suborbicular, finely bullate, lower pairs (always?) free ..... 13. **coadunatum**

Leaves ± broadly elliptic or broadly oblong to obovate, not bullate, all pairs connate ..... 14. **naudinianum**

25(13) Leaves scabrid beneath; plant otherwise glabrous ..... 17. **montanum**

Leaves pruinose or scabrellous to pubescent or villous on both sides; stem pruinose or scabrellous to pubescent or pilose or rarely (22. *cuisinii* and 23. *lanuginosum* both in part) glabrous 26

26(25) Bracts and bracteoles densely glandular-auriculate 27

Bracts and bracteoles not auriculate but often with longer glandular cilia towards base 32

27(26) Stem and leaves puberulous to pubescent; rootstock not creeping or rooting; stem sometimes gland-dotted; leaves, sepals and petals sometimes with laminar black glands 28

Stem and leaves strigose-pubescent to pilose or villous; rootstock creeping and rooting; stem, leaves, sepals and petals without laminar black glands 31

28(27) Sepals acute to subacute, (4–)5–8 mm long; petals (8–)10–15 mm long; stems 0.2–0.75 m long, if decumbent then not rooting (18. **annulatum**) 29

Sepals rounded, 2.6–4.5 mm long; petals 6–8 mm long; stems 0.04–0.15 m long, if decumbent then rooting ..... 24. **decaisneanum**

29(28) Petals, sepals and leaves without laminar black glands; stem eglandular; stem and leaves densely pubescent ..... 18a. **annulatum** subsp. **annulatum**

Petals and sometimes sepals and leaves with laminar black glands; stem glandular or not; stem and leaves glabrous to densely pubescent 30

30(29) Petals red-tinged dorsally; stem usually densely black (rarely red)-gland-dotted; leaves and sepals sometimes with laminar black glands ..... 18c. **annulatum** subsp. **afromontanum**

Petals not red-tinged (rarely red-veined) dorsally; stem eglandular or rarely sparsely black-gland-dotted; leaves and usually sepals without laminar black glands ..... 18b. **annulatum** subsp. **intermedium**

31(27) Stems erect to ascending, strigose-pubescent; leaves sessile, 12–35 mm long ..... 19. **delphicum**

Stems procumbent, weak, pilose; leaves petiolate, 8–15 mm long ..... 20. **athoum**

32(26) Sepals with laminar black glands, margin always glandular-ciliate 33

Sepals without laminar black glands, margin sometimes eglandular and denticulate or entire ..... 23. **lanuginosum**

33(32) Sepals 3.5–5 mm long, margin long-glandular-ciliate (stalk more than 2 × gland); leaves sessile, 15–55 mm long; stems erect to decumbent but not rooting ..... 21. **atomarium**

Sepals 2.5–3.5 mm long, margin medium- to short-glandular-ciliate (stalk 2 × gland or less); leaves sometimes petiolate, 2–15(–23) mm long; stems decumbent to diffuse-ascending, rooting ..... 22. **cuisinii**

[10] Plants with characters intermediate between Spp. 7 and 9 are probably hybrid (see p. 184).

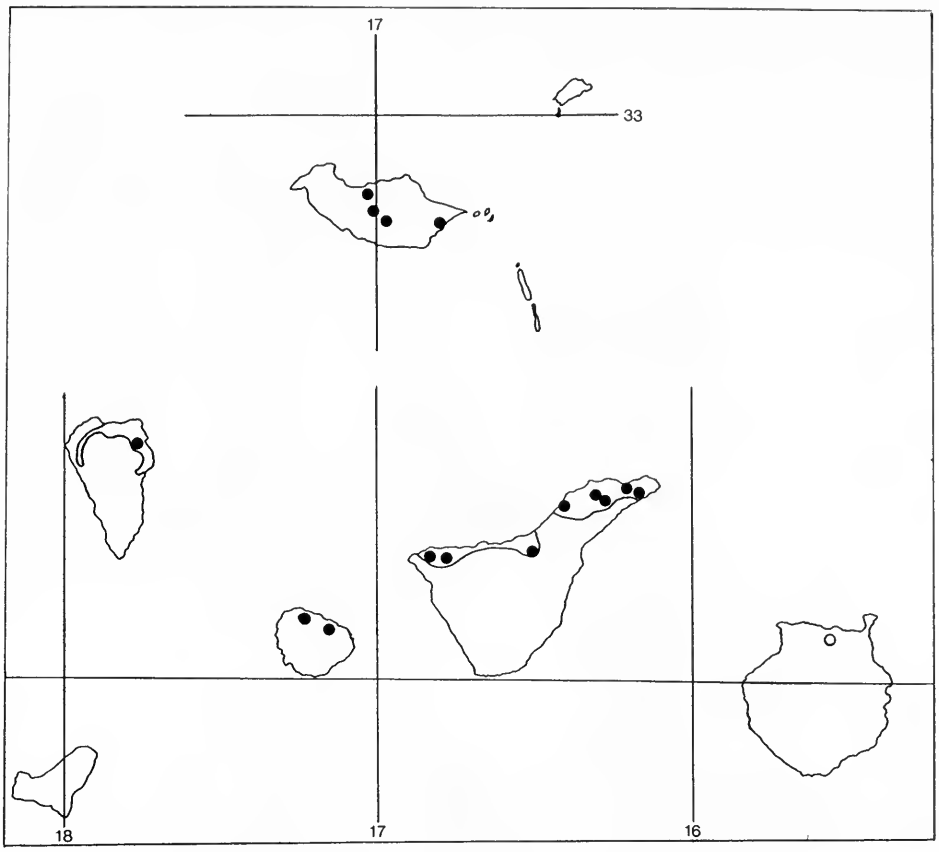
Subsect. 1. **Aethiopica** N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 69 (1993). Type: *H. aethiopicum* Thunb. (see p. 90).

Shrubs or subshrubs or perennial herbs, completely glabrous; leaves free; bracts and bracteoles not glandular-auriculate. Species 1–6.

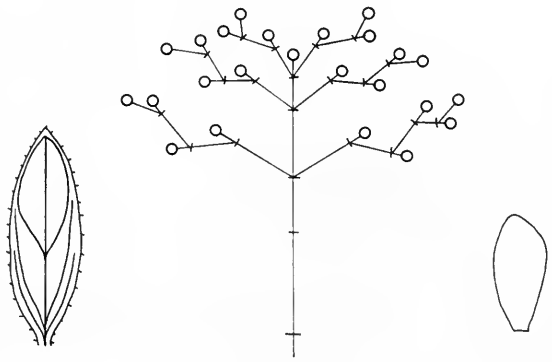
1. **Hypericum glandulosum** Aiton, *Hort. kew.* **3**: 107 (1789), 2nd ed. **4**: 428 (1812); Vahl, *Symb. Bot.* **2**: 86 (1791); Willd., *Sp. pl.* **3**: 1464 (1802); Buch in *K. Akad. Wiss. Berlin Abh.* **1816–1817**: 366, 380 (1817); Choisy, *Prodr. monogr. Hypéric.*: 53 (1821), in DC., *Prodr.* **1**: 551 (1824); Link in Buch, *Phys. Beschr. Canar. Ins.*: 153, 166 (1828); Webb & Berth., *Phytogr. canar.* **1**: 44, t. 3 (1836); Spach in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836); Lowe, *Fl. Madeira*: 76 (1868); Masferrer in *An. Soc. esp. Hist. nat.* **9**: 27 (1880); Pitard & Proust, *Les Îles Canaries*: 133 (1909); Menezes, *Fl. Archip. Madeira*: 29 (1914); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 148 (1933), **12**: 82 (1934), in *Pflanzenareale* **4**(1): Karte 2b (1933); Grabham, *Pls seen in Madeira*: 95 (1934); Ceballos & Ortuño, *Veg. Fl. for. Canar. occid.*: 387 (1951); Lid in *Skr. norske Vidensk.-Akad.* I, Math.-Nat. Kl., N.S. no. 23: 120 (1967); Bramwell, D. & Z., *Wild fls Canary Is.*: 162, f. 42, t. 199 (1974); Voggenr. in *Dissert. Bot.* **26**: 655, 689 (1974); Kunkel, *Endemismos Canarios*: 294 (1977); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72 (1995). Type: Madeira, without precise locality, Cook's First Voyage, fl. 1768, *Banks & Solander* s.n. (BM!-holotype). Dryander (the actual author of *Hortus kewensis*) cites only 'Introduced 1777. *Fr. Masson*.'; but there is no Masson specimen in the BM collection and Masson's introduction may have been of living material only. At any rate, Dryander's description was almost certainly derived from the Banks & Solander specimen, which therefore should be regarded as the holotype. Fig. 25A, Map 30.

Icon: Webb & Berth., *Phytogr. canar.* **1**: t. 3 (1836).

Shrub 0.25–*c.* 1.4 m tall, straggling to spreading below, with branches



Map 30 Sect. 27: 1. *H. glandulosum* ● specimens,○ record. Limits on Tenerife and La Palma according to Voggenreiter (1974).



rigid above, the whole plant glabrous. *Stems* pale yellowish to reddish, shallowly 4-lined but not ancipitous when young, soon terete; internodes shorter than leaves; cortex exfoliating in strips; bark straw-brown, finely striate. *Leaves* sessile; lamina (20–)30–60 × (6–)10–20 mm, ± narrowly elliptic to elliptic-oblanceolate, somewhat paler beneath, chartaceous, not glaucous, plane, spreading; apex acute or subapiculate to obtuse or rounded, margin entire or undulate to serrulate, with prominent but sessile round- or flat-topped black glands or proximally or rarely wholly entire with glands immersed, base narrowly cuneate to attenuate; venation: (2)3 pairs of laterals curved-ascending from lower 0.35–0.4 of midrib, tertiary reticulation obscure; laminar glands pale, dense, unequal, ± prominent; marginal and/or intramarginal glands black, dense. *Inflorescence c.* 10–45-flowered from up to 3 nodes, curved-corymbiform to hemispherical, dense; pedicels 3–4.5 mm; bracteoles (and bracts at uppermost 2 nodes) reduced, narrowly elliptic, with prominent marginal black glands. *Flowers c.* 15–20 mm in diam.; buds narrowly ellipsoid, acute. *Sepals* 4.5–7 × 1.5–2(–2.5) mm, slightly unequal, free, elliptic-oblong to elliptic or (the smaller) lanceolate-elliptic, acute, with sessile marginal glands or distally glandular-denticulate; veins 5, branching; laminar glands pale or a few black, linear or interrupted; marginal glands black, ± flat-topped, prominent, dense. *Petals* rather pale dull yellow, tinged or lined bright red dorsally, 10–14 × 3–4 mm, *c.* 2 × sepals, narrowly elliptic-oblong, acute (i.e. apiculus acute, apical); laminar glands pale, striiform to punctiform; marginal glands all black or some pale, all prominent or some immersed distally. *Stamens c.* 25–30, longest 7–9 mm, *c.* 0.7 × petals; anther gland amber. *Ovary* 2.5–3 × 1.5 mm, ellipsoid; styles 5–6 mm, 2 × ovary, spreading-incurved. *Capsule* 4–5.5 × 2.5–4 mm, ovoid, shorter than sepals, enclosed by petals twisting together. *Seeds* pale yellow-brown, 0.5–0.6 mm long; testa very shallowly linear-foveolate, almost smooth. 2n=18 (van Loon & de Jong, 1978; Reynaud, 1986), 40 (Dalgaard, 1986).

Open rocky hillsides or cliffs in *Laurus* forest or among *Erica* thickets; 300–900 m or sometimes down to maritime region in barrancos (Canary Is.), 200–700 m (Madeira).

Canary Islands (Tenerife, Gomera, La Palma, Gran Canaria), Madeira.

CANARY ISLANDS. Tenerife: Vueltas de Taganana, 16 July 1858 (st), *Lowe* Ten 183 (BM, K), ibid., 12 April 1971 (fl), *Bramwell & Humphries* 3395 (BM); Mercedes, 5 June 1892 (fl), *Murray* s.n. (BM, K), loc. cit., 20 March 1936 (fl), *Nielsen* 1697 (C*, K); Anagagebirge zwischen El Bailladero und Roque Chinobre, 700 m, 12 January 1977 (fl), *Gilli* s.n. (W); Montañas de Anaga, Barranco de las Huertas, 13 km above San Andres, 8 April 1975 (fl), *J., M. & P. Cannon* 4677 (BM). Gomera: El Monte, Hermigua, 18 April

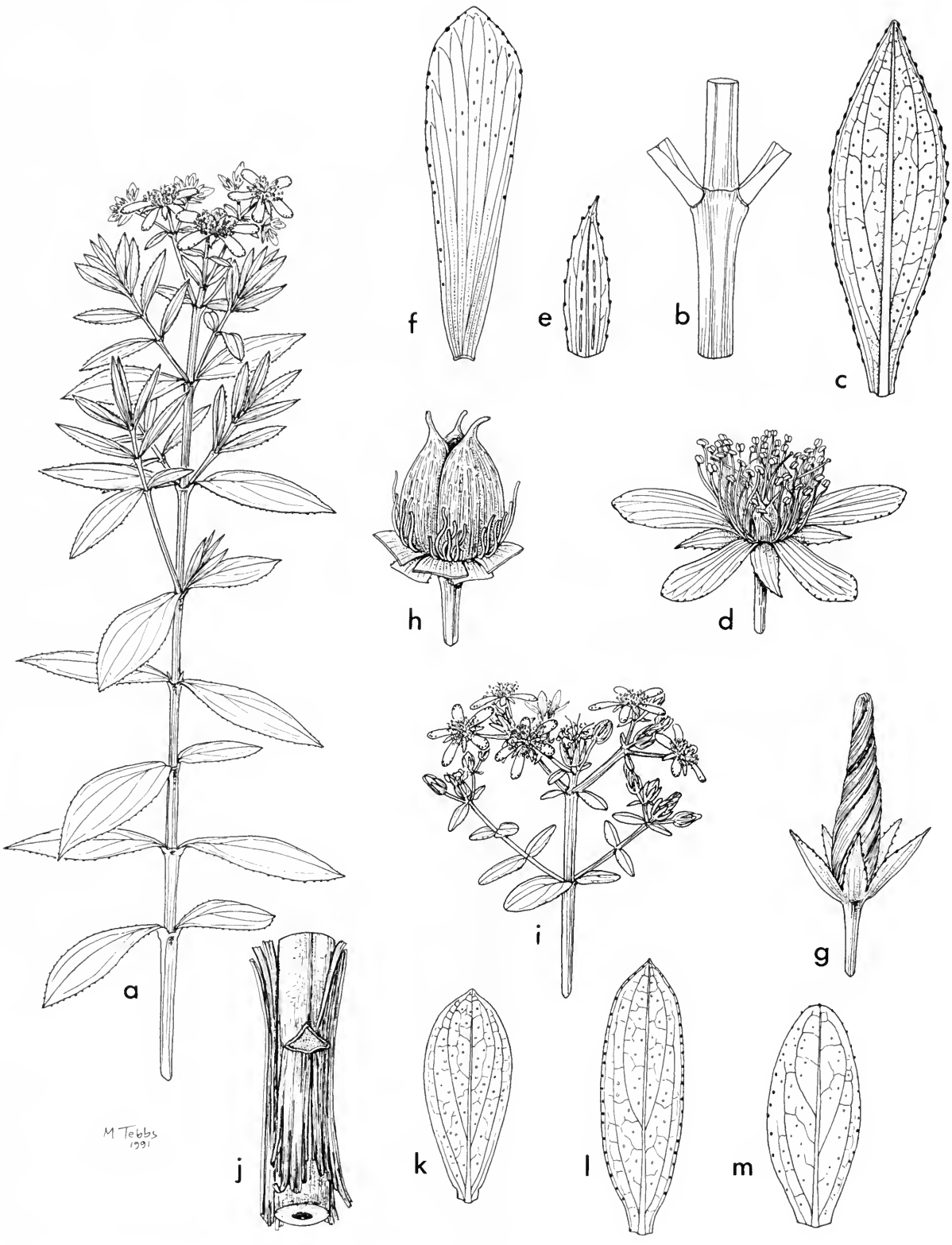


Fig. 25 A. *H. glandulosum*: (a) habit; (b) stem node; (c) leaf; (d) flower; (e) sepal; (f) petal; (g) closed flower, showing twisted petals; (h) capsule. B. *H. conjungens*: (i) inflorescence; (j) section of stem, showing flaking bark. C. *H. kiboënse*: (k) leaf. D. *H. abilianum*: (l) leaf. E. *H. afrum*: (m) leaf (a, i × ½; c × 1; d, k-m × 2; b, d, e-h, j × 3). A. *Jarvis* 628. B. *Robson* 269. C. *Rogers* 155. D. *Exell & Mendonça* 2995A. E. *Robert & Cosson* in Herb. Soc. Dauph. 5205.

1861 (fl), *Lowe* 146 (BM, K); near Vallehermose, Chorros de Epina, 700 m, 9 May 1977 (fl), *Jarvis* 628 (BM). La Palma: Los Sauces, Barranco de Agua, 25 May 1858 (fl), *Lowe* P.210 (BM); Barranco Galga, 23 February 1888 (fl), *Kuntze* s.n. (K). Gran Canaria: no specimens seen.

MADEIRA. Curral das Freiras, 3 July 1855 (fl), *Lowe* s.n. (BM, K), 12 July 1974 (fl & fr), *McClintock* s.n. (BM); near Machico, 300 m, 28 April 1924 (fl), *Riley* 26 (BM, K), Levada Machico, between valleys of Ribeiras Funda and Seca, *c.* 200 m, 4 April 1985 (fl), *Press* 710 (BM).

H. glandulosum has as its nearest relative in sect. 1. *Campylosporus* the east African *H. quartinianum*, its flower and fruit differing essentially from those of the latter in having '3' stamen fascicles, a 3-merous ovary with spreading styles, fading petals that twist around the developing ovary, and almost smooth seeds. The inflorescence branching is initially dichasial, as it often is in the closely related *H. roeperianum*, which has a more widespread African distribution than *H. quartinianum* (see Robson, 1985: 194–201).

H. glandulosum is rather distantly related to the other Canary Island shrub in sect. *Adenosepalum*, 16. *H. reflexum*, and differs in its glandular-margined leaves (which have laxer venation and are broadest about the middle, not below), and glandular-ciliate sepals and bracteoles. In addition, *H. glandulosum* includes tetraploids on the base 10 (2n=40) and diploids on the base 9 (2n=18), whereas *H. reflexum* is apparently diploid only (2n=18). *H. glandulosum* is usually completely glabrous, whereas *H. reflexum* normally has a pubescent stem. Plants intermediate in leaf form between the elliptic typical of *H. glandulosum* and the triangular-lanceolate of typical *H. reflexum* have been found. Those like *H. reflexum* but with ovoid or ovoid-lanceolate leaves have been named *H. reflexum* var. *myrtillifolium* Bornm., whereas those similar to *H. glandulosum* in leaf shape but with villous-tomentose stems and villous-pilose leaves have been described as a distinct species, *H. joerstadii* Lid.

It should be noted that: i) *H. glandulosum* and *H. reflexum* are typically not only distinct but very different in stem, leaf and sepal characters; ii) *H. glandulosum* in Madeira (in the absence of *H. reflexum*) shows no tendency to vary towards that species; and iii) each species has apparently given rise to quite distinct species groups on the African mainland. For these reasons it seems best to regard *H. glandulosum* and *H. reflexum* as 'good' species and all or most of the variation observed in the Canaries as due to hybridization between them.

1x. **Hypericum × joerstadii** Lid in *Skr. Norske Vidensk.-Akad.* I. Math.-Nat. Kl., N.S. no. 23: 121, f. 9a (1967). Type: Canary Islands, Tenerife, Pedro Alvarez, 1954 (fl), *Lid* s.n. (O-holotype).

Icon: Lid in *Skr. Norske Vidensk.-Akad.* I. Math.-Nat. Kl., N.S. no. 23: 121, f. 9a (1967).

Shrub intermediate in characters between 1. *H. glandulosum* and 16. *H. reflexum*. *Stem* terete when mature, glabrous or ± densely villous-tomentose, especially when young. *Leaves* 30–50 × 15–30 mm, elliptic to elliptic-oblong or obovate, glabrous or villous-pilose on both sides, acute to rounded, margin entire or with sessile black glands, base cuneate to rounded, tertiary reticulate venation obscure to marked and rather dense. *Sepals* with black marginal glands all prominent or some immersed and interspersed with glandular cilia.

Canary Islands (Tenerife, La Palma).

CANARY ISLANDS. Tenerife: Cumbre above Afur, 1957, *Joerstad* s.n. (O*); El Rosario S. of Esperanza, 1020 m, 1957, *Lid* s.n. (O*); Valle de Guerra to Cruz Chiquita, 1 April 1975 (fl), *J., M. & P. Cannon* 4429 (BM); ibid., *J., M. & P. Cannon* 4450 (BM); 1.6 km beyond Taganana towards Puerto Anaga, 15 July 1858 (fr), *Lowe* Ten 280 (BM, K). La Palma: Barranco del Carmen, 1 June 1913 (fl), *Sprague & Hutchinson* 174 (K); Barranco Agua in Los Sauces, 220 m, 1954, *Lid* s.n. (O*); Barranco Santa Lucia, 200 m, 1954, *Lid* s.n. (O*).

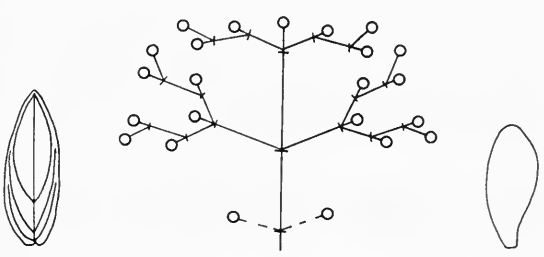
Of the specimens cited above, *Cannon* 4429 and 4450 are typical *H. glandulosum* except for the hairs on young shoots, *Lowe* Ten. 280 is typical *H. reflexum* (and apparently with good seed) except for the elliptic-oblong leaves, while the remainder are intermediate (except for the hairy leaves) and are all paratypes of *H.* × *joerstadii*. It is possible that 16. *H. reflexum* var. *leiocladum* (i.e. *H. reflexum* with glabrous stems) should be included here, in which case the first lead of couplet 4 in the key (p. 171) would indicate *H.* × *joerstadii* instead of *H. reflexum*.

2. **Hypericum abilianum** N. Robson in *Bolm. Soc. broteriana* II, **53**: 114, ff. 1, 2 (1980). Type: Angola, Huila, near Posto Zootécnico, near Humpata, *c.* 2000 m, 21 June 1937 (fl), *Exell & Mendonça* 2995A (BM!-holotype; COI, LISJC).

Fig. 25D, Map 31.

H. kiboënse sensu N. Robson in *Kew Bull.* **12**: 437 (1958), pro parte quoad specim. *Exell & Mendonça* 2995A.

Icon: *Bolm Soc. broteriana* II, **53**: 121, f. 2 (1980).

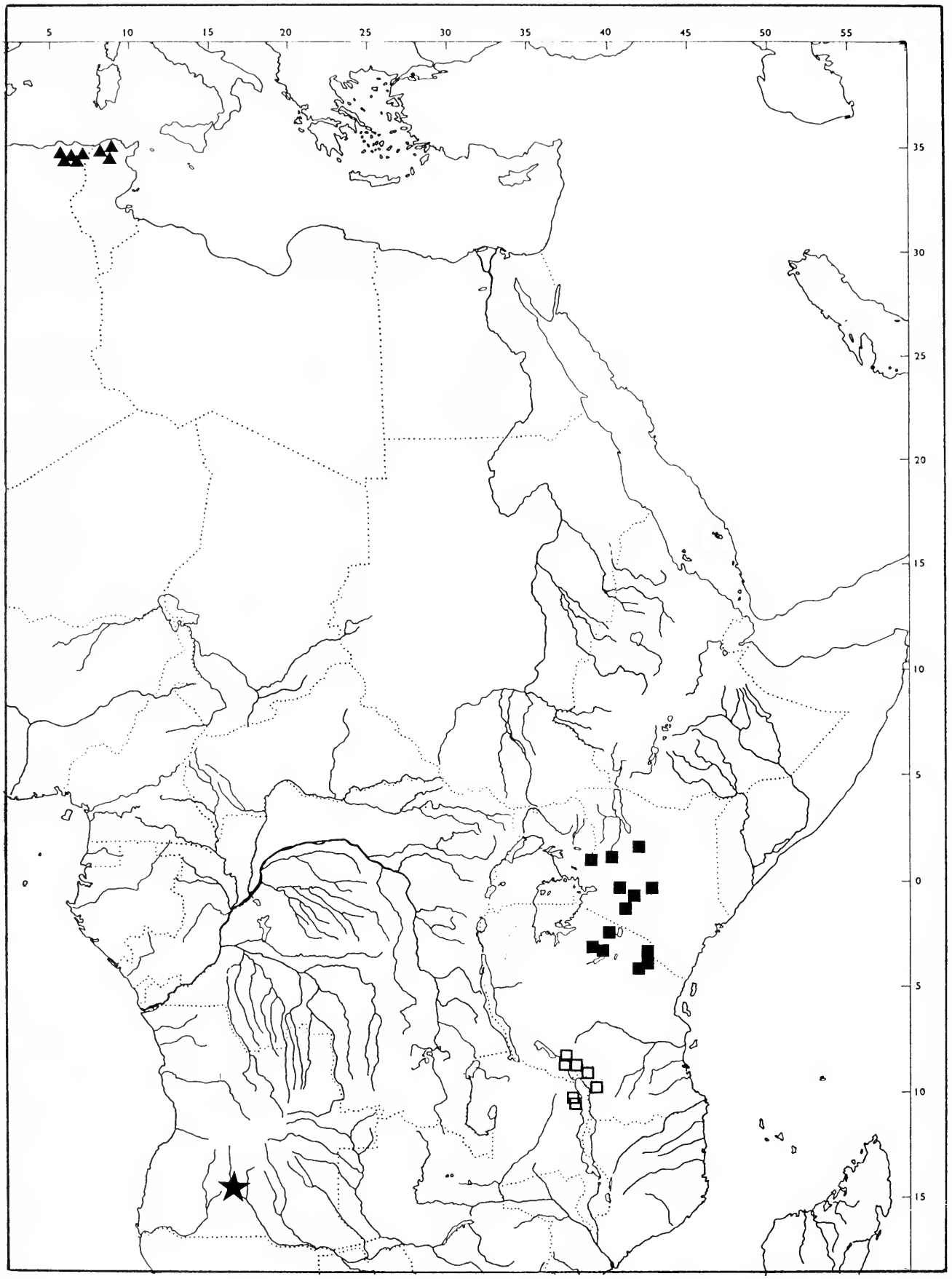


Subshrub 0.4 m tall, erect, with branches strict, glabrous. *Stems* orange to vinous red, 4-lined and ancipitous when young, soon 2-lined, eventually terete, internodes shorter than leaves; cortex exfoliating in strips; bark reddish brown, finely striate. *Leaves* sessile or with petioles to 0.2 mm long; lamina 12–16 × 3.5–6 mm, lanceolate to narrowly oblong or elliptic-oblong, paler beneath, chartaceous, not glaucous, with margins plane or recurved (in drying?), spreading; apex acute to apiculate or obtuse, margin entire, base cuneate to subcordate; venation: 3(4) pairs of laterals curved-ascending from lower 0.3–0.35 of midrib, tertiary reticulation dense; laminar glands pale, dense, unequal, not prominent; intramarginal glands black, dense. *Inflorescence c.* 3–5-flowered from up to 3 nodes, congested, curved-corymbiform, with irregularly disposed flowering branches from lower nodes; pedicels 1–3 mm; bracteoles reduced, narrowly lanceolate, with dense marginal black glands. *Flowers c.* 15 mm in diam.; buds ellipsoid, subacute. *Sepals* 6–7 × 1.4–1.6 mm, subequal, free, narrowly oblong to lanceolate, acute, entire; veins 5–7, branching; laminar glands pale, linear, distally interrupted to striiform; inframarginal glands black, dense. *Petals* golden yellow, tinged red dorsally, 8–10 × 4–4.5 mm, *c.* 1.7 × sepals, oblong-oblanceolate, rounded with apiculus apiculate, subapical; laminar glands mostly pale, linear to striiform or punctiform, occasionally black, solitary, punctiform; marginal glands black, slightly prominent. *Stamens c.* 70, longest 7–8 mm, *c.* 0.85 × petals; anther gland black. *Ovary c.* 3 × 1.5 mm, ovoid-pyramidal; styles 4.5 mm, 1.5 × ovary, spreading-incurved. *Capsule* and *seeds* unknown.

'Among grass and low ericoid shrubs'; *c.* 2000 m.

Angola (Huila).

ANGOLA. Huila: near Humpata, near Porto Zootécnico, 21 June 1937 (fl), *Exell & Mendonça* 2995A (BM, COI*, LISJC*).



Map 31 Sect. 27: 2. *H. abilianum* ★; 3. *H. conjungens* □; 4. *H. kiboënse* ■; 5. *H. afrum* all records ▲.

H. abilianum is closely related to the East African 3. *H. kiboënse* and 4. *H. conjungens*, but differs from both in its lanceolate to oblong, acute to obtuse leaves. It is nearer *H. conjungens* in its erect, strict-branching habit, and its leaves are intermediate in size between those of *H. conjungens* and *H. kiboënse* but nearer in shape to those of *H. glandulosum*.

H. abilianum is known so far from only one collection.

3. **Hypericum conjungens** N. Robson in *Kew Bull.* **13**: 397 (1959), in Exell & Wild, *Fl. zamb.* **1**: 381 (1961); Spirlet, *Contr. Fl. Congo, Rwanda, Burundi*, Guttiferae: 6 (1966); Bamps in Boutique, *Fl. Congo, Rwanda, Burundi*, Guttiferae: 5 (1970), in *Bull. Jard. bot. natn. Belge* **41**: 436 (1971), in *Distrib. Plantarum Africanarum* **3**: map 69 (1971); Lisowski, Malaisse & Symoens in *Bolm. Soc. broteriana* II, **44**: 231 (1970); Bamps, Robson & Verdc. in Polhill, *Fl. trop. E. Afr.*, Guttiferae: 30 (1978); Robson in *Bolm. Soc. broteriana* II, **53**: 115, f. 1 (1980) ['*conjugens*']. Type as for *H. conjunctum* N. Robson (1958) non Y. Kimura (1938).

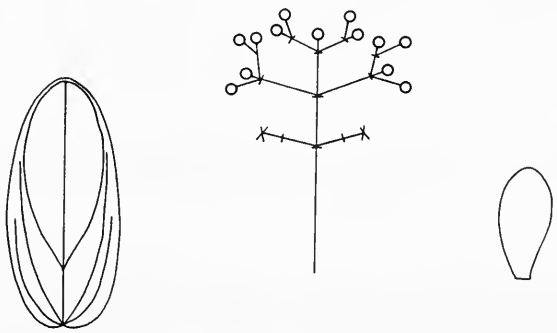
Fig. 25B, Map 31.

H. sp. B sensu Milne-Redh. in Turrill & Milne-Redh., *Fl. trop. E. Afr.*, Hypericaceae: 12 (1953).

H. conjunctum N. Robson in *Kew Bull.* **12**: 437, map 1 (1958), non Y. Kimura (1938). Type: Tanzania, S. Highlands Prov., Njombe Distr., Mdapo, March 1954 (fl), *Semsei* 1643 (K!-holotype; PRE).

H. milne-redheadii Gilli in *Annln naturh. Mus. Wien* **74**: 425, t. 1 f. 1 (1970). Type: Tanzania, S. Highlands Prov., Njombe Distr., bei Madunda in Livingstonegebirge, 2050 m, 29 July 1958 (fl & fr), *Gilli* 176 (W!-holotype).

Icon: Gilli in *Annln naturh. Mus. Wien* **74**: 425, t. 1 f. 1 (1970).



Shrub or *subshrub* c. 0.3–2 m tall, slender, erect, with branches ± strict, glabrous. *Stems* orange to vinous red, 4-lined and ancipitous when young, soon 2-lined, eventually terete, internodes mostly equalling or exceeding leaves; cortex exfoliating in sheets; bark smooth, finely striate. *Leaves* sessile or sometimes lower ones very shortly petiolate; lamina 10–30 × (5–)7–20(–22) mm, oblong to elliptic-oblong or rarely obovate, paler beneath, chartaceous, not glaucous, spreading; apex rounded to retuse, margin ± undulate, base rounded to cordate-amplexicaul; venation: (2)3 pairs of laterals curved-ascending from lower 0.2–0.25 of midrib, tertiary reticulation well-developed, dense; laminar glands pale, dense, unequal, not prominent; intramarginal glands black, dense. *Inflorescence* c. 5–20-flowered, from 1–2 nodes, congested, curved-corymbiform, with branches from up to 3 nodes below; pedicels 1–3 mm; bracteoles foliar or usually reduced, narrowly oblong to narrowly triangular-lanceolate, with dense marginal to inframarginal black glands. *Flowers* c. 15–20 mm in diam.; buds ellipsoid, subacute. *Sepals* 5–8 × 1–2 mm, subequal, free, oblong-lanceolate to lanceolate, acute, entire to subentire; veins 5, sometimes branching; laminar glands pale, linear, distally interrupted; marginal to inframarginal glands black, dense. *Petals* primrose yellow, tinged and sometimes veined red dorsally, 10–12 × 2–2.5 mm, 1.5–2 × sepals, oblong, rounded, with apiculus obsolete, subapical; laminar glands pale, linear to dorsally striiform or subpunctiform, occasionally black, subapical, punctiform; marginal glands black, not or slightly prominent. *Stamens* c. 80, longest 7–8 mm, 0.7–0.8 × petals; anther gland black. *Ovary* 2.5–3 × 1.5–2 mm, ovoid-pyramidal; styles 2.5–3.5 mm, (1–)1.2 × ovary, spreading-incurved. *Capsule* 6–7 × 3–3.5 mm, ovoid-pyramidal, shorter than sepals, surrounded by erect, individually twisted petals. *Seeds* dark brown, 0.7–1 mm long; testa scalariform-reticulate.

Upland grasslands, grassy valleys and forest margins; 1800–2910 m.

Zaire (Shaba), Tanzania (Southern Highlands: Mbeya and Njombe districts), Malawi (North: Nyika), Zambia (Eastern: Nyika).

ZAIRE. Shaba: Marungu, Kisinde, *Dubois* 1090 (BR*); Marungu, Kasiki, 2200 m, June 1969, *Lisowski, Malaisse & Symoens* 6476 (BR*).

TANZANIA. Southern Highlands: Mbeya Distr., Poroto Mts, Upper Kiwira R., 1950 m, May 1938 (fl), *Maclunes* 415 (BM); Mbeya distr., 19.2 km from Mbeya to Chunga, 2400 m, May 1959 (fl), *Procter* 1215 (K); Njombe Distr., Matamba, 1800 m, 8 January 1957 (fl), *Richards* 7593 (K).

MALAWI. North: Rumphi Distr., Nyika Plateau, near Nganda road, 8 June 1960 (fl), *Chapman* 748 (BM, K, SRGH*); Chitipa Distr., Nyika Plateau, north end, 4 km from Nganda, 2380 m, 29 July 1972 (fl & fr), *Brummitt & Synge* WC 75 (K).

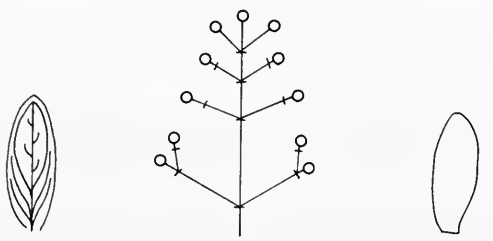
ZAMBIA. Eastern: Nyika Plateau, c. 4 km SW from [Northern Rhodesian] Rest House, 2100 m, 22 October 1958 (fl), *Robson* 269 (BM, K, LISC, SRGH).

H. conjungens is intermediate not only between 4. *H. kiboënse* and 6. *H. aethiopicum* (the origin of the specific epithet), but also between 3. *H. abilianum* and *H. kiboënse*. Like the other species in this group (Spp. 1–6), it is thus clearly a relict of considerable antiquity; although the morphological differences between Spp. 2, 3 and 4 are not great, the geographical distances between them are. *H. conjungens* differs from *H. abilianum* mainly in leaf shape and internode length, whilst the shrubbier habit and more congested inflorescence (*inter alia*) distinguish it from *H. aethiopicum*. It is usually distinguished from *H. kiboënse* by its longer, sessile leaves and slender, strict habit; but the population of that species from Mt Meru (N. Tanzania) and the specimen (*Rammell* F.D. 3492 (K)) from Narok (S. Kenya) originally included by me in *H. conjungens* (*H.* sp. A sensu Milne-Redhead, 1953), narrow the morphological gap between these species considerably. In *Fl. Trop. E. Africa*, Guttiferae (Bamps, Robson & Verdcourt, 1978: 30), I expressed doubts as to the exact identification of 'sp. A'; but it is now clear to me that it exhibits an extension of variation of *H. kiboënse* (q.v.) rather than constituting a disjunct population of *H. conjungens*.

4. **Hypericum kiboënse** Oliv. in *Trans. Linn. Soc.* II, Bot. **2**: 329 (1887); Engl. in *Phys. Abhand. Königl. Akad. Wiss. Berlin* **1891**: 307 (1892), *Pflanzenw. Ostafr.* **C**: 274 (1895), *Veg. der Erde* **3**(2): 500 (1921), T.C.E. Fr. in *Notizbl. bot. Gart. Berlin* **8**: 566 (1923); Brenan, *Tang. Terr. Checklist* **2**: 249 (1949); Milne-Redh. in Turrill & Milne-Redh., *Fl. trop. E. Afr.* Hyperic.: 6 (1953); Hedberg in *Symb. Bot. Upsal.* **15**(1): 131 (1957); N. Robson in *Kew Bull.* **12**: 437 (1958); Dale & Greenway, *Kenya trees & shrubs*: 235 (1961); Agnew, *Upland Kenya wild fls*: 186 (1974); Bamps, Robson & Verdc. in Polhill, *Fl. trop. E. Afr.* Guttiferae: 30 (1978). Type: Tanzania, Kilimanjaro, 3900 m, 1884 (fl), *H.H. Johnston* 136 (K!-holotype).

Fig. 25C, Map 31.

H. kiloense sensu H.H. Johnston, *Kiliminjaro Exped.* App.: 338 (1886), sphalm.
H. sp. A sensu Milne-Redh. in Turrill & Milne-Redh., *Fl. trop. E. Afr.* Hyperic: 12 (1953).
H. conjunctum sensu Agnew, *Upland Kenya wild fls*: 187 (1974).



Shrub or subshrub up to 2.5 m tall, spreading to straggling and often much branched, with branches ± strict to ascending, glabrous. *Stems* orange to vinous red, 2-lined and ancipitous when young, soon terete, internodes mostly shorter than leaves; cortex exfoliating in sheets or strips; bark irregular, flaking. *Leaves* up to 0.7 mm petiolate or rarely sessile; lamina 6–18(–21) × 2.5–7(–8) mm, oblong to elliptic-oblong or obovate, paler beneath, chartaceous, not glaucous, plane, spreading; apex rounded or mucronulate, margin plane or rarely undulate, base cuneate to rounded; venation: (2)3 pairs of laterals curved-ascending from lower *c.* 0.35 of midrib; tertiary reticulation well developed but rather obscure; laminar glands pale, dense, unequal, sometimes prominent, sometimes also 1–2 black, subapical, punctiform; intramarginal glands black, ± dense. *Inflorescence* 1–*c.* 10-flowered, from up to 3 nodes, not or scarcely congested, broadly pyramidal when fully developed, with branches from up to 2 nodes below; pedicels 2–4 mm; bracteoles reduced, lanceolate, with ± dense inframarginal black glands. *Flowers c.* 15–22 mm in diam.; buds ellipsoid, subacute. *Sepals* (occasionally 4), 4.5–6 × 1–2.2 mm, subequal to equal, free, oblong-lanceolate to lanceolate, acute, entire or usually with prominent marginal glands or partly glandular (rarely eglandular) -denticulate; veins 5, not branching; laminar glands pale, linear, distally interrupted to punctiform; marginal to inframarginal and occasionally submarginal glands black or occasionally reddish, dense. *Petals* (occasionally 4) golden yellow, tinged red dorsally, 8–11 × 3–4.5 mm, *c.* 2 × sepals, elliptic-oblong to oblanceolate, rounded, with apiculate obsolete, subapical; laminar glands pale, linear to distally subpunctiform; marginal and sometimes inframarginal glands black, subprominent on inner margin. *Stamens c.* 40–50, longest 6–10 mm, *c.* 0.8–0.9 × petals; anther gland black. *Ovary* 3(4)-locular, 3–4 × 1–2 mm, ovoid-pyramidal to ovoid; styles 3(4), 3.5–5, 1–1.3 × ovary, spreading-subincurved. *Capsule* 6–7 × 3.5 mm, ovoid-pyramidal to ovoid, exceeding sepals, not enclosed by spreading, individually twisted petals. *Seeds* yellow-brown, *c.* 0.7 mm long; testa finely scalariform-foveolate.

Upland grassland, bushland and forest margins, often along streams; (1800)2100–3900 m.

Uganda (Mt Elgon), Kenya (Mt Elgon, Aberdares, Mt Kenya, Mt Nyiru), Tanzania (Kiliminjaro, Mt Meru, Mt Oldeani, Lemagrut).

UGANDA. Eastern: Mbale Distr., Mt Elgon above Sipí, 2700 m, September 1934 (fl), *Synge* 1065 (BM); Mt Elgon, Bulambuli, 2700 m, August 1929 (fl), *Saunders & Hancock* 60 (K).

KENYA. Northern Frontier Distr.: Mt Nyiru, 2700 m, 5 January 1959 (fl), *Newbould* 3451 (K). Rift Valley: Trans-Nzoia Distr., Mt Elgon, 3360 m, 23 February 1934 (fl & fr), *Taylor* 3614 (BM); Elgeyo Distr., Cherangani Hills, Embobut Forest above Arror valley, 3240 m, January 1971 (fl), *Tweedie* 3916 (K); West Aberdares, 2400 m, 29 July 1913 (fl), *Battiscombe* 710 (K). Central: Fort Distr., S. Kinangop Forest Reserve, Wamunu, 2400 m, 23 November 1959 (fl), *Kerfoot* 1415 (K); North Nyeri Distr., Mt Kenya, Sirimon Track just N. of Timau, 2850–3000 m, 23 December 1963 (fl), *Verdcourt* 3459 (K). Masai: Masai Distr., N. of Narok, *c.* 1800 m, n.d. (fl & fr), *Rammell* F.D. 3492 (K).

TANZANIA. Northern: Moshi Distr., Kiliminsharo, S.O. Seite, 2300 m, 28 December 1933 (fl), *Schlieben* 4419 (BM, K, P*, Z); Loliondo, Ngosaro Samba, near Kenya border, 6 July 1956 (fl), *Williams* 701 (K); Arusha distr., Mt Meru, NE rim of crater, 2530 m, 6 October 1977 (fl), *Raynal* 19442 (K); Masai distr., Lemagrut Mtn, S. side, near road to Endulea, *c.* 2550 m, 19 June 1965 (fl), *Herlocker* 129 (K); Mbulu distr., Mt Oldeani W. side, 2850 m, 16 February 1961 (fl), *Newbould* 5709 (K).

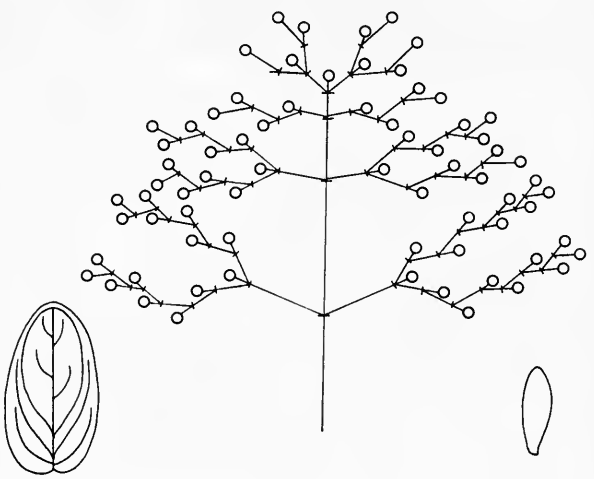
H. kiboënse is a higher-altitude derivative (or relative) of *H. conjungens*, differing essentially from it in the shrubbier straggling habit, smaller ± petiolate plane-margined leaves, laxer inflorescence, more prominently glandular-denticulate sepals and fewer stamens. The more southern populations in Tanzania (on Mts Meru, Oldeani and Lemagrut) are also morphologically nearer to *H. conjungens*; but the nearest morphologically is *Rammell* F.D. 3492, from Kenya, Masai Distr. (Sp. A in Milne-Redhead (1953)). This grew at a lower altitude than the other populations and has somewhat larger leaves, rounded to subcordate at the base, and more numerous stamens. It cannot, however, be included in *H. conjungens* because the leaves are too narrow and mostly shortly petiolate, and is best treated as an aberrant population of *H. kiboënse*.

5. **Hypericum afrum** Lam., *Encycl.* **4**: 166 (1797); Desf., *Fl. atlant.* **2**: 215 (1798); Choisy, *Prodr. monogr. Hypéric.*: 50 (1821), in DC., *Prodr.* **1**: 549 (1824); Batt. & Trab., *Fl. Algérie*, Dicots **1**: 181 (1888); Barratte in Coss., *Ill. fl. atlant.* **2**: 11, t. 102 (1892); Julien, *Fl. Constantine*: 60 (1894); Barratte in Bonnet & Barratte, *Pl. vasc. Tunisie*: 73 (1896); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 175 (1933), **12**: 87 (1934), in *Pflanzenareale* **4**(1): Karte 6a (1933); Maire in *Bull. Soc. Hist. nat. Afr. N.* **27**: 215 (1936); Quézel & Santa, *Nouv. Fl. Algérie* **2**: 683 (1963); Pott.-Alap., *Fl. Tunisie* **1**: 509 (1979). Type: Algeria, prope La Calle, 1785, *Poiret* s.n. (P-holotype).

Fig. 25E, Map 31.

H. perforatum sensu Poir., *Voy. Barbarie* **2**: 224 (1789).

Icon: Coss., *Ill. fl. Atlant.* **2**: t. 102 (1892).



Perennial herb (1–)2 m tall, erect, ± suffrutescent at base, branched all up stem, with branches short, strict to ascending, glabrous. *Stems*

vinous red, narrowly 2-lined but otherwise terete, not ancipitous, internodes exceeding leaves; cortex exfoliating in sheets. *Leaves* sessile; lamina 10–15(–20) × 3–5(–11) mm, narrowly oblong to elliptic-oblong or lower often obovate to oblanceolate, paler beneath, papyraceous, thinly glaucous, plane, spreading to deflexed; apex rounded, margin recurved and ± undulate, base cuneate to cordate-amplexicaul; venation: 3(4) pairs of main laterals ascending from lower 0.25–0.5 of midrib, midrib branched above, tertiary reticulation obscure; laminar glands pale, dense, unequal, relatively small, not prominent; intramarginal glands black, dense. *Inflorescence c.* 60-flowered from 3–4 nodes with branches from up to 2 nodes below, the whole globose and rather congested to broadly pyramidal and rather lax, sometimes with additional flowering branches from further down stem; pedicels 3–4 mm; bracteoles reduced, linear-lanceolate, sparsely black-glandular-ciliate. *Flowers* 12–15 mm in diam.; buds ovoid-ellipsoid, rounded. *Sepals* 3–3.5 × 0.7–1 mm, subequal, slightly basally connate, narrowly ovate-oblong to linear-lanceolate, acute, glandular-denticulate to -ciliate; veins 5, not branching or 3, branching; laminar glands pale, shortly linear to striiform or rarely punctiform; marginal glands black, small, rather sparse. *Petals* golden? yellow, tinged red dorsally, 7–8 × 3–3.5 mm, *c.* 2.3 × sepals, narrowly elliptic to oblong-elliptic, rounded, with apiculus amber- or black-glandular; laminar glands pale, linear to distally punctiform; inframarginal glands black, sparse, on inner margin only. *Stamens c.* 35–40, longest *c.* 5.5–6.5 mm, *c.* 0.8 × petals; anther gland black. *Ovary c.* 2 × 1 mm, narrowly ovoid-pyramidal; styles *c.* 3 mm, 1.5 × ovary, erect-outcurved. *Capsule* 5–6 × 3–4 mm, ovoid-pyramidal to ovoid, exceeding sepals, usually enclosed by petals twisted together. *Seeds* straw-coloured, *c.* 0.7 mm long; testa finely linear-foveolate.

Marshes, streamsides and damp moors; *c.* 300–700 m.

NW Tunisia (Mogods, Kroumirie), Algeria (Constantine, E. Algiers).

TUNISIA. Mogods: Cap Serrat (*fide* Pottier-Alapetite, 1979). Kroumirie: Forêt d'Aïn-Draham, 15 September 1885 (fr), *Robert & Cosson* in *Soc. Dauph.* (1887) 5205 (BM); à l'est de Tabarque [Tabarka], 6 July 1883 (fl), *Cosson* et al. s.n. (K); Aïn Draherru [Draharu], 18 September 1893 (fr), *Robert* s.n. (K); Djebel Gorra (*fide* Pottier-Alapetite, 1979).

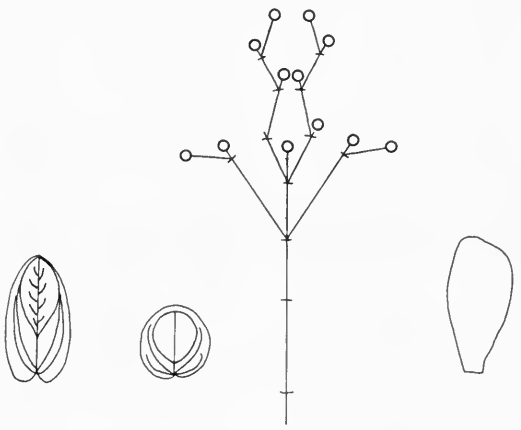
ALGERIA. Constantine: prope La Calle, June 1839 (fl), *Bové* s.n. (K); inter Philippeville [Skidka] et Bone [Annaba], in paludosis ditionis Senhadja, 3 July 1861 (fl), *Letourneux & de la Perraudière* in *Kralik*, Pl. Alger. 108 (K); près Bone, du versant sud de l'Eydough [Dj. Eydough], June 1866 (fl & fr), *Trabut* in *Frag. Fl. alger. exsicc.* 562 (BM). Alger: *fide* Quézel & Santa (1963).

H. afrum is quite different from other Mediterranean species of *Hypericum*. It has been associated with *H. elegans* Stephan ex Willd. (sect. 9. *Hypericum*) by Stefanoff (1933*a*, 1934) and with *H. undulatum* Schousboe ex Willd. in the same section by me (Robson, 1977*a*); but it does not fit well into sect. *Hypericum*. On the other hand, all the characters discordant in that section fit in sect. 27. *Adenosepalum* (e.g. the old petals twisting together over the developing capsule, and the pale linear-foveolate seeds); and *H. afrum* can easily be interpreted as the third species in a northward cline: *H. conjungens-H. kiboënse-H. afrum*. It must therefore be a relict species of considerable antiquity.

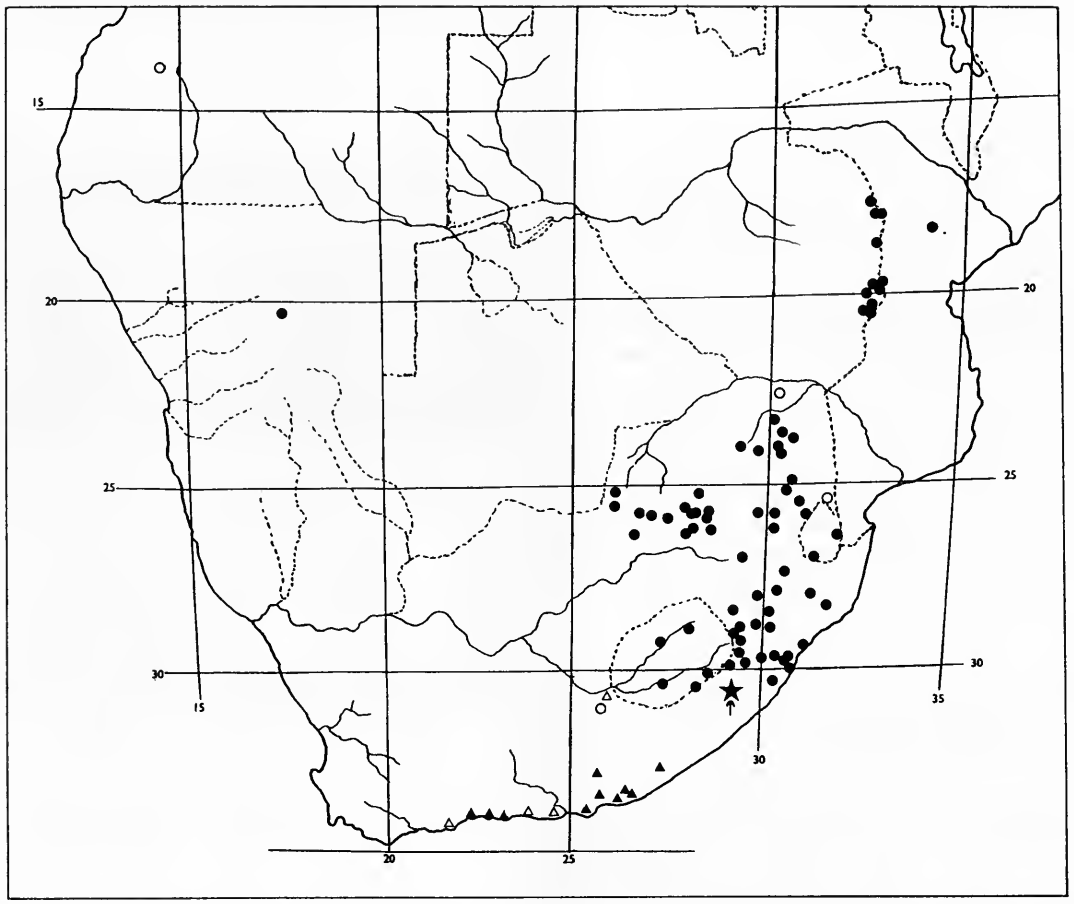
6. **Hypericum aethiopicum** Thunb., *Prodr. fl. cap.*: 138 (1800), *Fl. cap.*: 439 (1823); Choisy in DC., *Prodr.* **1**: 552 (1824); Eklon & Zeyher, *Enum. pl. Afr. austr.*: 53 (1835); Sonder in Harv. & Sond., *Fl. cap.* **1**: 117 (1860); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Exell & Mendonça, *Consp. Fl. Angolensis* **1**: 120 (1937); Bredell in *Bothalia* **3**: 577 & map (1939); Robson in *Kew Bull.* **3**: 438 & map (1958), in Exell & Wild, *Fl. zamb.* **1**(2): 382, t. 73A (1961); Gibson, *Wild fls Natal (coast. reg.)*: t. 67, f. 4 (1975); Killick & Robson in J. Ross, *Fl. southn Afr.* **22**: 17, f. 4 (1976). Type: South Africa, Cape Province, 'Crescit in Robbeberg, Houtniquas' (fl), *Thunberg* s.n. (α UPS-lectotype, K!-sketch; β UPS, K!-sketch).

Map 32.

Icon: J. Ross, *Fl. southn Afr.* **22**: 18, f. 4 (1976).



Perennial herb sometimes woody at base, 0.1–0.45(–0.6) m tall, with stems arising from woody rootstock, erect or decumbent, unbranched, glabrous. *Stem* green to vinous red, sometimes ancipitous or 2-lined above, otherwise terete, eglandular or black-gland-dotted, internodes shorter than to exceeding leaves; cortex sometimes exfoliating in strips. *Leaves* sessile or rarely to 0.4 mm petiolate, 5–25 × 3–15 mm, ± broadly ovate or more rarely orbicular or elliptic-ovate to oblong, paler beneath, sometimes glaucous beneath or on both sides, plane, chartaceous to membranous, spreading or ± appressed; apex obtuse or rarely subacute to rounded, margin entire, often recurved, base cordate-amplexicaul to rounded; venation: 4 pairs of laterals curved-ascending from lower 0.4–0.7 of midrib, tertiary reticulation rather lax, often obscure; laminar glands pale or rarely 1–2 black, dense, unequal, sometimes prominent; intramarginal glands black, rather dense. *Inflorescence* 1–*c.* 25-flowered from up to 3 nodes, curved-corymbiform, lax or ± congested, occasionally with flowering branches from lower nodes; pedicels 2–4(–5) mm; bracteoles reduced, ovate to linear-lanceolate or narrowly elliptic, with dense marginal black glands sometimes prominent or on cilia. *Flowers* 15–25 mm in diam.; buds ellipsoid, acute. *Sepals* 4–8 × 1.5–2 mm, subequal, lanceolate or linear-lanceolate to oblong, acute to acuminate, entire to glandular-ciliate; veins 5, unbranched; laminar glands pale and/or black, striiform to punctiform; inframarginal or marginal or marginal glands black, stometimes on cilia, dense. *Petals* canary yellow, usually tinged red dorsally, (8–)10–13(–15) × 3–5 mm, 2–4 × sepals, elliptic to oblanceolate-spathulate, rounded to subtruncate with apiculus obsolete, subapical; laminar glands mostly black, ± elongate-punctiform with a few pale, striiform to punctiform; marginal to inframarginal glands black, rarely prominent, distally dense. *Stamens c.* 50–70, ± indistinctly 3(4)-fascicled, longest 7–10 mm, 0.7–0.8 × petals; anther gland amber. *Ovary* 3(4)-locular, 2–4 × 1.5–2 mm, ovoid; styles 3(4), 3–6.5 mm, (1.7–)2–3 × ovary, spreading-incurved. *Capsule* 6–7 × 3–4 mm, narrowly ovoid-pyramidal to ellipsoid, shorter than to slightly exceeding sepals, enclosed by petals twisting together. *Seeds* chestnut brown, *c.* 1 mm long; testa finely linear-foveolate.



Map 32 Sect. 27: 6. *H. aethiopicum*: a. subsp. *sonderi* ● specimens, ○ records; b. subsp. *aethiopicum* ▲ specimens, Δ records; intermediates between subspecies (arrow) ★.

Open grassland or more rarely bare or cultivated areas or seasonal swamps in high-rainfall areas; 135–1850 m.

South Africa (Cape Province, Natal, Orange Free State, Transvaal), Lesotho, Swaziland, Zimbabwe (eastern), Mozambique (central), Angola (Huila).

H. aethiopicum is most closely related to 3. *H. conjungens*, having a ± herbaceous habit with the woodiness confined to below ground level or sometimes the base of the stems. It can be divided into two subspecies, of which the northern (subsp. *sonderi*) is the less specialized in most characters except for the black-gland-dotted stems. The southern subsp. *aethiopicum* has eglandular stems, but the sepal margin is glandular-ciliate, not entire, and the habit is never as robust as it is in some Transvaal and Natal plants. There is also a northward reduction trend, the plants of subsp. *sonderi* from Zimbabwe, Mozambique and Angola being smaller with smaller, usually ± orbicular leaves. The correlation of gland-dotted stems and entire sepals occasionally breaks down, hence the reason for making these taxa subspecies.

6a. **Hypericum aethiopicum** subsp. **sonderi** (Bredell) N. Robson in *Kew Bull.* **12**: 440 & map (1958), in Exell & Wild, *Fl. zamb.* **1**: 382 (1961); Letty, *Wild fls Transvaal*: 220, t. 109 f. 3 (1962); Trauseld, *Fl. pls Natal Drakensberg*: 125 & photographs (1969); Jacot Guill., *Fl. Lesotho*: 211 (1971); Killick & Robson in J. Ross, *Fl. southn Afr.* **22**: 19, f. 4.2 (1976); Fabian & Germish., *Transvaal wild fls*: 178, t. 84d (1982). Type as for *H. sonderi* Bredell.

H. aethiopicum var. *glaucescens* Sond. in Harv. & Sond., *Fl. cap.* **1**: 118 (1860); Burtt Davy, *Man. pl. Transvaal*: 251 (1926). Type: Transvaal, Magalisberg, Aapjesrivier, October (fl), *Zeyher* 149 (S-lectotype, selected here; BM!, LU!). The citation by Sonder ('at Aapjes River and Macallisberg, Zeyher') implies that more than one Zeyher specimen was seen, and so the above specimen has been selected as the lectotype. Killick & Robson (1976) mention *Burke* s.n. from Magalisberg (BM!, K!) as possibly another syntype.

H. aethiopicum sensu Sond. in Harv. & Sond., *Fl. cap.* **1**: 118 (1860), pro parte; Baker f. in *J. Linn. Soc. Lond.* (Bot.) **40**: 26 (1911); Eyles in *Trans. Roy. Soc. S. Afr.* **5**: 420 (1916); Norlindh in *Bot. Notiser* **1934**: 101 (1934); Exell & Mendonça, *Consp. Fl. Angolensis* **1**(1): 120 (1937), et auct. plur.

H. aethiopicum var. *huillense* Engl. in *Bolm Soc. broteriana* **17**: 83 (1900), nomen.

H. sonderi Bredell in *Bothalia* **3**: 578 & map (1939); Verdoorn in *Fl. pls S. Afr.* **23**: t. 8897 (1943). Types: (numerous specimens cited, from Transvaal to Cape Province) Natal, in planitie prope Camperdown, 900 m, 17 September 1893 (fl), *Schlechter* 3270 (K!-lectotype, Robson, 1958; G!, PRE!, Z!-isolectotypes).

H. sonderi var. *transvaalense* Bredell in *Bothalia* **3**: 579 & map (1939). Types: Transvaal, Pietersburg Distr., Woodbush, Mountain Home Farm, 1530 m, 18 December 1935 (fl), *Mogg* 13996

(PRE!-lectotype, Robson, 1958; K!); Shiluwane, *Junod* 4290 (PRE!-syntype); without locality, *Wager* TRV7223 p.p. (PRE!-syntype).

Icones: Exell & Wild, *Fl. zamb.* **1**: 384, t. 73A (1961); J. Ross, *Fl. southn Afr.* **22**: 18, f. 4.2 (1976).

Stems black-(or occasionally amber-)gland-dotted. *Sepals* entire or almost so, with marginal glands immersed or ± prominent but not on denticles or cilia.

Northern Cape Province (Kokstad) north to eastern Zimbabwe and central Mozambique; Angola (Huila).

ANGOLA. Huila: Humpata, December (fl), *Newton* 161 (COI*).

ZIMBABWE. East: Inyanga, prope dejectum fluminis Pungwe, *c.* 1800 m, 6 November 1930 (fl), *Fries, Norlindh & Weimark* 2733 (BM, LU, PRE); Umtali, Stapleford Forest Reserve, Hope Patrol, 1800 m, 16 October 1959 (fl), *Chase* 7174 (BM, SRGH); Melsetter, Chirinda, 20 October 1947 (fl), *Wild* 2070 (K, SRGH).

MOZAMBIQUE. Manica & Sofala: Mossurize, Espungabera, 13 November 1943 (fl), *Torre* 6187 (BM, LISJC*).

SWAZILAND. Hlatiku, Verdun, *c.* 750 m, 14 November 1986 (fl), *Compton* 26322 (K, PRE*)[11]; Siteki-Mhlumeni road, 15 km from Siteki, by fence round Blue Jay Ranch, 575 m, 29 August 1978 (fl), *Prior* 187 (K).

TRANSVAAL. Zoutpansberg Distr.: near Entabeni, 19 August 1930 (fl), *Hutchinson* 4238 (BM, K). Pietersburg Distr.: Duiwelskloof, 9 July 1929 (fl), *Galpin* 9401 (K, PRE*). Pilgrim's Rest Distr., Pilgrim's Rest, lower end of town above Velijde R., 18 November 1937 (fr), *Galpin* 1454 (K, PRE*). Lydenburg Distr.: bei Lydenburg, January 1884 (fl), *Wilms* 137 (BM, K, Z). Pretoria Distr.: Magaliesberg, *c.* 1400 m, 12 December 1955 (fr), *Schlieben* 7682 (K, Z). Rustenburg Distr.: *c.* 2.9 km NE of Derby Stn, 1530 m, 28 January 1962 (fl & fr), *Acocks* 21971 (K, PRE*). Belfast Distr.: Rictolei, Crocodile R., June 1932 (fl), *Smuts* 29 (K). Barberton Distr.: Saddleback Mtn, southern slopes, 1095–1440 m, October–November 1890 (fl), *Galpin* 1116 (GRA*, K). Ermelo Distr.: near Sheepmoor, February 1960 (fr), *de Winter* 7519 (K, PRE*).

ORANGE FREE STATE. Ventersdorp Distr.: Ventersdorp, 1530 m, 7 November 1966 (fl), *Bayliss* 3710 (Z). Harrismith Distr.: Harrismith, 1800 m, November 1904 (fl), *Sankey* 22 (K). Ladybrand Distr.: Ladybrand, 1650 m, 27 December 1958 (l. fl), *Werdermann & Oberdieck* 1566 (B*, K).

NATAL. Vryheid Distr.: Twekloof, Altemooi, December–January 1925–6 (fl), *Thode* A1146 (K). Hlabisa Distr.: Zululand, 330 m, 22 November 1953 (fl), *Ward* 1758 (K, PRE*). Louwsburg Distr.: Itala Nature Reserve, 1200–1260 m, 7 December 1975, *Brown & Shapiro* 13 (K, PRE*). Ladysmith Distr.: near Cathedral Peak, near Uhlumbonje R., 3 November 1957 (fl), *Goodier* 350 (K, SRGH*). Bergville Distr.: Tugela valley, Mont-aux-Sources, 1650 m, 20 February 1926 (fl), *Bayer & McClean* 212 (K, PRE*). Pietermaritzberg Distr.: between Drummond and Cato Ridge, January 1974 (fr), *Stirton* 1008 (K, PRE*). Port Shepstone Distr.: Marina Beach, *Strey* 5950 (PRE*).

LESOTHO. Lereibe, 1913? (fl), *Dieterlen* 358 (K); 22 km from Outhing, near Senka bridge, 1520 m, 10 December 1977 (l. fl), *Killick* 4370 (K, PRE*).

CAPE PROVINCE. Griqualand East: Glen Hope, November 1913 (fl), *Jacottet & Jacottet* 570 (Z). ? Distr.: near Fraser Hills, Ntsubane Forest Stn, 1400 m, 24 August 1976 (fl), *Venter & Vorster* 121 (K, PRE*). Aliwal North Distr.: Doctors Drift, *Gerstner* 137 (PRE*).

6b. **Hypericum aethiopicum** subsp. **aethiopicum**

Icon: J. Ross, *Fl. southn Afr.* **22**: 18, f. 4.1 (1976).

Stems eglandular or very rarely with a few amber gland dots. *Sepals* with margin black-glandular-denticulate or -ciliate distally or wholly.

South-eastern Cape Province (Griqualand East to Riversdale).

CAPE PROVINCE. Griqualand East: without precise locality, February, *Tyson* 1376 p.p. (PRE*). Mt Currie Distr.: Kokstad, Glengarry Road near Kokstad, 12 January 1976 (fl), *Coleman* 876 (K, NH*). Matatiele Distr.: Cedarville, November, *Bandert* 102 (GRA). Herschel Distr.: Sterksprüit, May, *Hepburn* 380 (GRA*). Albert Distr.: Albert district, 186- (fl), *Cooper* 1774 (K). Stutterheim Distr.: Stutterheim Commonage, 780 m, 27 December 1942 (fl), *Acocks* 9544 (K, PRE*). Cathcart Distr.: Kabousie R., December, *Flanagan* 794 (GRA*, SAM*). King William's Town Distr.: King William's Town, *Flanagan* 2142 (PRE*, SAM*). Victoria East Distr.: Victoria East, *Rattray* 130 (PRE*). Stockenstroom Distr.: Katberg, 24 November 1902 (fl), *Sole* 583 (Z). Fort Beaufort Distr.: Adelaide, Great Winterberg, January, *Ford* 11410 (PRE*). Bedford Distr.: Bedford, December, *Binnie* 213 (GRA*). Albany Distr.: Albany, Highlands Station, 1800 m, 1 June 1978 (fl), *Bayliss* 8794 (Z). Somerset East Distr.: in clivis ad latera Montis Boschberg prope Somerset East, *c.* 900 m, December 1874 (fl), *MacOwan* 397 (K). Alexandria Distr.: Karlsrand, near Karl Landsman Memorial, 360 m, 9 November 1954 (fl), *Johnson* 1085 (K). Uitenhage Distr.: ad montis radices 'Chumiberg' (Kafferland), September–October 1835 (fr), *Ecklon* 415 (FR, K); Port Elizabeth, Zuurberg Sanatorium, 1 November 1930 (fl), *Long* 225 (K). Humansdorp Distr.: Assegaibos, November, *Marloth* 10931 (PRE*). Knysna Distr.: Prince Alfred's Pass, 900 m, 15 December 1937 (fr), *Wall* 368 (LU); below Boukamma & Ruigte Vlei, 135 m, April 1928 (fl), *Fourcade* 3919 (K). George Distr.: Kamanasie Hills, near George, November 1847 (fl), *Prior* s.n. (K, PRE*). Riversdale Distr.: Corente R., *Muir* 855 (PRE*, SAM*).

Coleman 846 (from Kokstad) is one of the specimens mentioned above as being morphologically intermediate between the two subspecies. It comes from the narrow zone of overlap between the respective areas of the subspecies, as does *Jacottet & Jacottet* 570 (Griqualand, Glen Hope (Z)). Bredell's (1939) record of subsp. *aethiopicum* from Herschel district, near the Lesotho border (Map 32), may be an error or an intermediate form. I have not seen the specimen (*Hepburn* 380 (GRA)).

Subsect. 2. **Pubescentes** N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 69 (1993). Type: *H. pubescens* Boiss. (see p. 90).

Perennial herbs, with indumentum up to sepals or lower part of inflorescence or rarely only to base of inflorescence; leaves free; bracts and bracteoles not glandular-auriculate. Species 7–12.

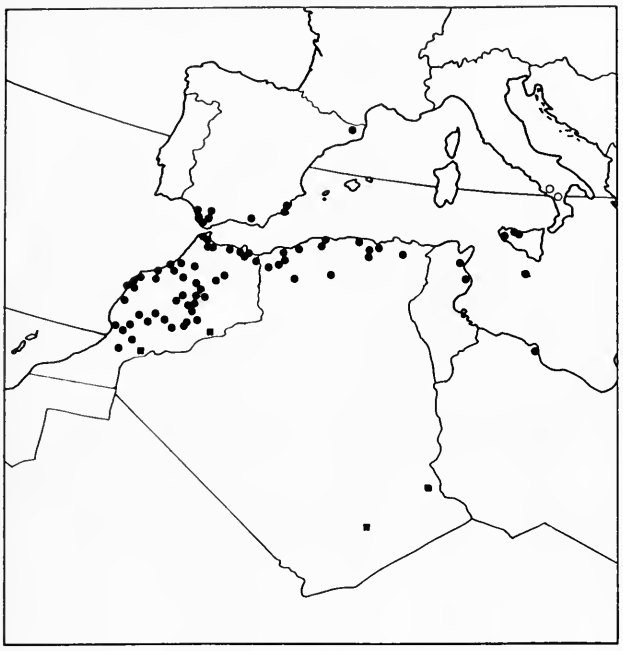
7. **Hypericum pubescens** Boiss., *Elench. pl. nov.*: 26 (1838), *Voy. bot. Espagne* **1**: t. 36, **2**: 115 (1840); Walp., *Repert. bot. syst.* **1**: 383 (1840); Ball in *J. Linn. Soc. London* **16**: 374 (1877); Amo, *Fl. fan. Penins. Iberica* **6**: 24 (1878); Willk. & Lange, *Prodr. fl. hispan.* **3**: 592 (1878), *Suppl.*: 272 (1893); Batt. & Trab., *Fl. Algérie*, Dicots. **1**: 183 (1888); Maire in *Mém. Soc. Sci. nat. Maroc* no. 7: 180 (1924); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 175 (1933), **12**: 87 (1934), in *Pflanzenareale* **4**(1): Karte 6a (1933); Sennen & Mauricio, *Cat. fl. Rif orient.*: 26 (1934); N. Robson in Tutin et al., *Fl. europaea* **2**: 266 (1968); Ali in Ali & Jafri, *Fl. Libya* Guttiferae: 8, f. 4 (1976); Haslam, Sell & Wolseley, *Fl. Maltese Is.*: 198 (1977); Pignatti, *Fl. Italia* **1**: 347 & map (1982); Ramos in *Trab. Depto Bot. Univ. Complut.* **12**: 54, t. 6 f. 1 (1982), in *Acta bot. Malacit.* **11**: 169, f. 9b (1986), in Valdés, Talavera & Fern.-Gonz., *Fl. vasc. Andalucía occ.* **1**: 318 & fig. & map (1987); Burdet, Charpin & Jacquemoud in *Candollea* **39**: 789 (1984); Greuter, Burdet & Long, *Med-Checklist* **3**: 273 (1986); Ramos in Castroviejo et al., *Fl. iberica* **3**: 184 (1993). Type: Spain, Granada, Sierra Nevada, inter Estepona et San Roque, *Boissier* s.n. (G-lectotype, Ramos, 5 December 1980; see Burdet et al., 1984).

Fig. 26A, Map 33.

H. tomentosum subsp. *pubescens* (Boiss.) Ball in *J. Linn. Soc. London* (Bot.) **16**: 374 (1877); Jahand. & Maire, *Cat. pls Maroc* **2**: 485 (1932), *Suppl.*: 1071 (1941); Quézel & Santa, *Nouv. Fl. Algérie* **2**: 682 (1963); Pott.-Alap., *Fl. Tunisie* 509 (1979).

H. tomentosum [var.] γ *pubescens* (Boiss.) Pérez Lara in *An. Soc.*

[11] Southern African records with an asterisk (*) have been seen by Killick but not by me.



Map 33 Sect. 27: 7. *H. pubescens* specimens ●, probably this species but recorded as *H. tomentosum* by Pignatti (1982) ○; 8. *H. psilophytum* ■.

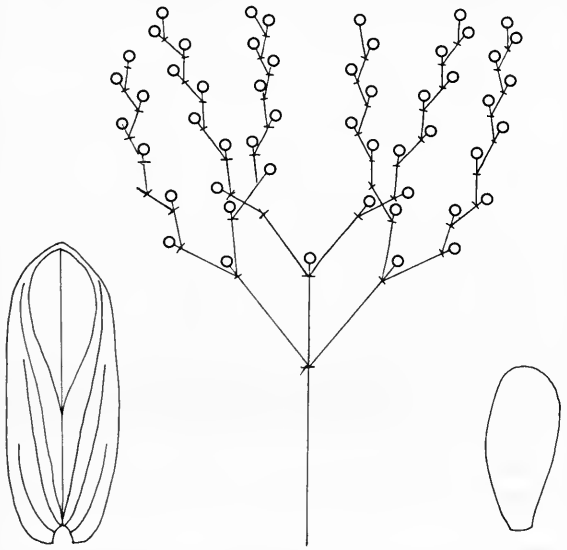
Esp. Hist. nat. **24**: 333 (1895); Fiori, *Nuov. Fl. Italia* **1**: 525 (1924).

H. aegusanum Tineo ex Lojac., *Fl. sicul.* **3**: 431 (1908), nomen.

H. tomentosum subsp. *pubescens* var. *viridulum* Pau in *Bol. R. Soc. esp. Hist. nat.* **22**: 57 (1922); Jah. & Maire, *Cat. pls Maroc* **2**: 485 (1932). Type: Morocco, Xauen, *Vidal y Lopez* s.n. (MA-holotype).

H. tomentosum subsp. *pubescens* var. *damnatorum* Maire in *Bull. Soc. Hist. nat. Afr. N.* **29**: 411 (1938). Type: Algeria, hot springs of Hammam-es-Skoutin (Aquae Tibelitanae), *Maire* s.n. (AL-holotype).

H. tomentosum sensu Guss., *Fl. sicul. syn.* **2**(1): 28 (1843); E. Durand & Barratte, *Fl. libic. Prodr.*: 48 (1910); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Borg, *Descr. fl. Maltese Is.*: 249 (1927) et auct. plur, pro parte omnes excl. typum.



Icon: Boiss., *Voy. bot. Espagne* **1**: t. 36 (1840).

Perennial herb c. 0.1–0.7 m tall, erect to decumbent or ascending or rarely prostrate, from ± woody taproot, branching, rooting and sometimes woody at base, upper branches sometimes present, spreading to ascending, the whole plant up to the sepals (dorsally) greyish-villous to -pubescent. *Stems* green to pale reddish, 2–4-lined and compressed in and near inflorescence, otherwise terete, internodes mostly exceeding leaves. *Leaves* sessile; lamina 6–40(–70) × 2–16(–23) mm, narrowly oblong or oblong-lanceolate to rarely ovate-oblong, concolorous, chartaceous, not glaucous, plane, spreading; apex subobtuse to usually rounded, margin plane, entire or very rarely lower leaves sparsely glandular-subdentate, base rounded to usually cordate-amplexicaul; venation: 3(4) pairs of laterals curved-ascending from base or up to lower 0.4 of midrib, tertiary reticulation rather dense, often obscure; laminar glands pale, dense, subequal, not prominent, sometimes also with a few black, punctiform, scattered; intramarginal glands black, rather dense to sparse; marginal glands (very rarely present) amber, globose, prominent. *Inflorescence* (1)3–*c.* 5-flowered from up to 3 nodes, curved-corymbiform, becoming monochasial after first flower, sometimes with flowering branches from up to most lower nodes, the whole then broadly triangular to cylindric; pedicels 1.5–3.5 mm; bracts not auriculate; bracteoles linear, usually with a few sessile black glands or (proximally) black-glandular-cilia. *Flowers* 15–30 mm in diam.; buds cylindric-ellipsoid, obtuse. *Sepals* 5–10 × 1.5–2.5 mm, subequal, linear-lanceolate to lanceolate, ± long-aristate, entire to subentire; veins 3(5), unbranched; laminar glands pale, punctiform to slightly elongate; marginal glands black, 3–5 on each side, sessile, the arista reddish and very rarely with small black apical gland. *Petals* pale to bright yellow, often veined dorsally, 9–15 × 3–6.5 mm, *c.* 1.5 × sepals, oblanceolate, rounded, apiculus apiculate or absent; laminar glands pale, striiform to punctiform; marginal to inframarginal glands black, not or scarcely prominent. *Stamens c.* 30–50, clearly 3-fascicled, longest 6–11 mm, 0.6–0.65 × petals; anther gland black. *Ovary* 2–3 × 1–2 mm, ovoid-ellipsoid to ellipsoid; styles 3, 5–7 mm, 2–3 × ovary, widely spreading-incurved. *Capsule* 6–7 × 3.5–5 mm, ovoid, shorter than sepals, enclosed by petals twisted together. *Seeds* purplish brown, 0.6–1 mm long; testa finely scalariform. 2n=18 (Robson, 1981), 36 (*fide* Ramos, 1987: 318); Reynaud, 1986.

River and stream margins, rocky ground, roadsides and waste habitats, often in damp ground; 0–1875 m.

Portugal (south), Spain (south), Morocco, Algeria, Tunisia, Malta, Sicily, Sardinia? (see below).

PORTUGAL. Algarve (*fide* Franco, *Nova Fl. Portugal* **1**: 450 (1971)).

SPAIN. Huelva and Sevilla: both *fide* Valdés et al., *Fl. Vasc. Andal. Occ.* **1**: 318 (1987). Cadiz: Puerto Santa Maria, Pinal del Cato, 8 June 1849 (fl), *Bourgeau* 104 (BM); 10 km from Rota, by Naval Base, 13 May 1979 (fl), *P.F. Cannon* 454 (RNG). Granada: prope Granatum, 1849 (fl), *Boissier & Reuter* s.n. (K). Murcia: Elche, July 1902 (fl & fr), *Prah & Sylva* s.n. (BM). Valencia: all specimens from this province seen so far appear to be (hybrid) intermediates (see p.184). Catalonia: Catalogne, Hostaleb (?), June 1906 (fl & fr), *Herb. Lacaita* 19056 (BM).

GIBRALTAR. Gibraltar, n.d. (fl.), *Gay* s.n. (BM).

MOROCCO. Tanger: ad pedem montis Zem-Zem (El Haus), 4 m, 12 June 1930 (fl), *Font Quer* 425 (BM, Z); halfway between Tangier and Tetuan, 250 m, 2 July 1973 (fl & fr), *Davis* 54714 (BM, E*). Rif: prope Ein-Zeren (Beni Uriaguel), 30 m, 20 July 1928 (fl & fr), *Font Quer* 306 (BM, Z); Targuist to Chechaouen, 40 km E. of Chechaouen, 28 June 1974 (fl), *Reading U./Brit. Mus. Exped.* 1098 (BM). Oranais littoral: Martimprey-du-Kiss à Aghbal, 13 June 1931 (fl), *Faure* s.n. (K). Centre nord: Volubilis, ruines romaines, 500 m, 3 June 1978 (fl), *Lewalle* 8854 (BM, BR*); 16 km from El-Hajab to Fès, 26 June 1974 (fl), *Reading U./Brit. Mus. Exped.* 1065 (BM).

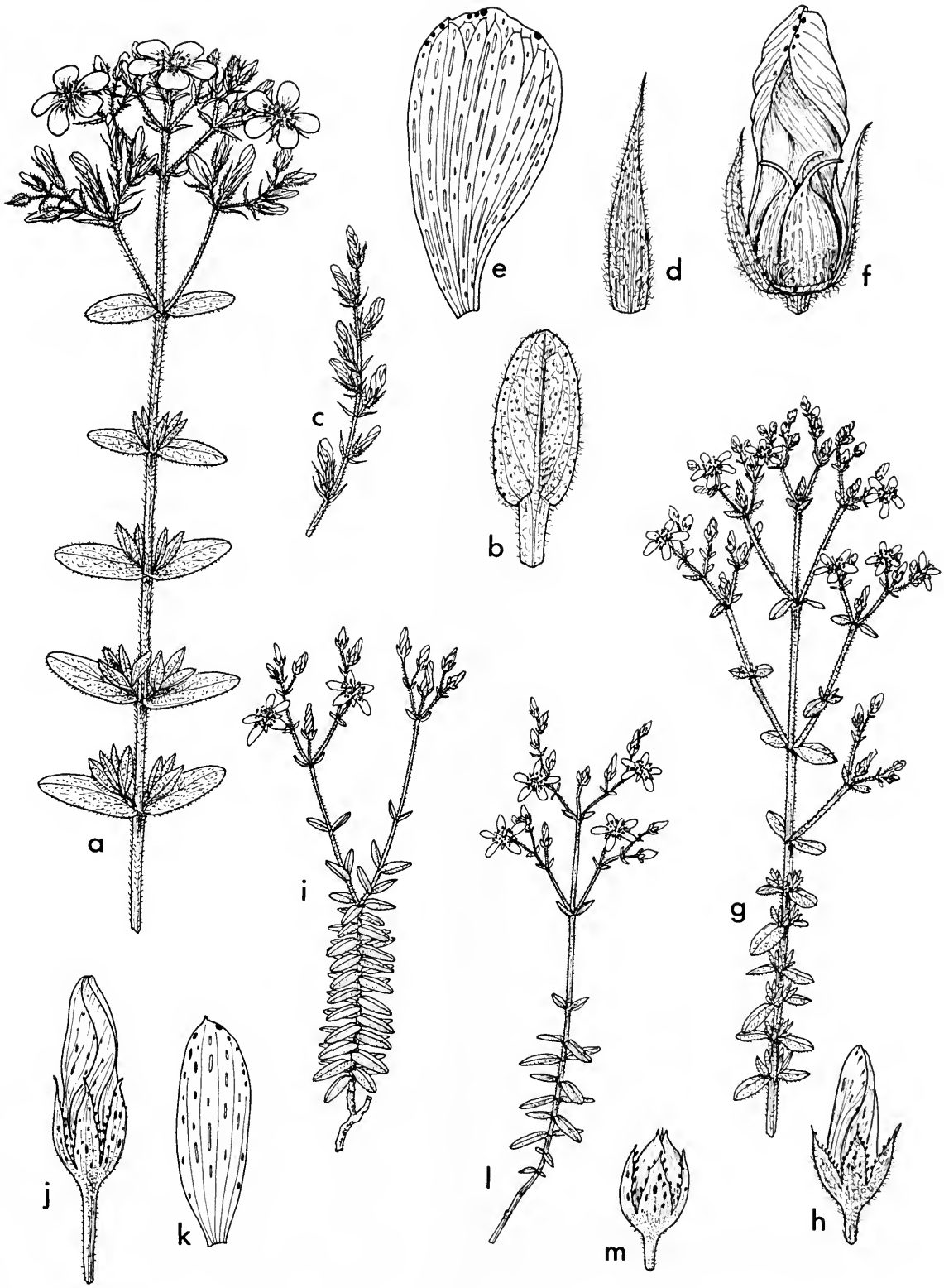


Fig. 26 A. *H. pubescens*: (a) habit; (b) leaf; (c) elongating inflorescence; (d) sepal; (e) petal; (f) capsule with two enclosing petals. B. *H. tomentosum*: (g) habit; (h) flower bud. C. *H. collenettiae*: (i) habit; (j) flower bud; (k) petal. D. *H. sinaicum*: (l) habit; (m) flower bud (a, c, g, i, l × ½; b × 1; d, f, h, j, k, m × 3). A. *Davis* 54993. B. *Davis* 59519. C. *Collenette* 3752. D. (l) *Schimper* 421, (m) *Collenette* 7589.

Monts de Zaïan: 30 km above Azrou, road to Ifrane, 1300 m, 26 June 1974 (fl), *Reading U./Brit. Mus. Exped.* 1052 (BM). Nord-ouest: *c.* 10 km SSE of Rabat, valley of Oued Akrech, 22 May 1961 (fl), *J. & P. de Wilde & Dorgelo* 2384A (BM, WAG*); prope oppidum Rabat, 3 May 1926 (fl), *Lindberg* 1661 (H, K). Sud-ouest: Cap Blanc au sud-ouest de Mayagan, 15 June 1950 (fl), *Sauvage* 8537 (K); Cap Beddouza [Meddouza], N. of lighthouse, 30 m, 1 June 1974 (fl), *Reading U./ Brit. Mus. Exped.* 116 (BM). Sud steppique: Sheshoua, May 1871 (fl), *Hooker* s.n. (K); Merrakish, Tanga, 30 June 1984 (fl), *Lewalle* 11022 (BM, BR*). Sud-ouest littoral: Cap Safi, 8 May 1926 (fl), *Lindberg* 1846 (H); environs d'Agadir, Sidi-Moussa, 21 May 1877 (l. fl), *Ibrahim* s.n. (K). Plaine de Sous: Taroudannt, 12 June 1920? (fl), *Lynes* 8 (BM). Moyen Atlas: Khenifra, village Imam Ines, 1300 m, 25 June 1981 (fl), *Lewalle* 9961 (BM, BR*); Ladla, Beni Mellal, 500 m, 28 May 1925 (fl), *Jahandiez* 379 (K). Grand Atlas: Jebel Sarhro, SE of Boumalne du Dadès, July 1969 (fl), *Bowler* 18 (BM); Tizi-n-Test to Taroudannt, 1100 m, 12 June 1974 (fl), *Reading U./Brit. Mus. Exped.* 570 (BM). Anti Atlas: 5 km from Tafraoute to Igherm, 1100 m, 9 June 1974 (fl), *Reading U./Brit. Mus. Exped.* 451 (BM); 2 km from Igherm to Taroudannt, 1800 m, 10 June 1974 (fl), *Reading U./Brit. Mus. Exped.* 554 (BM).

ALGERIA. Oran: Oued Imbert, 4 August 1929 (fl), *Faure* s.n. (BM); plaine du Lac Salé, July 1849 (fl), *Roman* s.n. (BM); Sidi Bel-Abbès to Tlemcen, between Ben Badis and Oued Mimoun, *c.* 1300 m, 7 June 1975 (fl), *Davis* 58818 (BM, E*). Alger: Blidah, Oued-el-Kebir, 10 August 1864 (l. fl), *Lefebvre* s.n. (K). Kabylie: between Les Falaises and Tichi (Bejaïa-Djidjelli), s.l., 28 May 1971 (fl), *Davis* 52932 (BM, E*); Kerrata, 800 m, July 1897 (fl), *Reverchon* 9 (BM). Constantine: Constantine, in declivitate humidis montis Mansourah, 6 July 1869 (fl), *Paris* 314 (BM); Constantine, July 1876 (fl & e. fr), *Reboud* 1144 (FR). Hauts-Plateaux oranais: Ravin de Tafaroua, 10 July 1868 (fl), *Allariou* (K). Atlas Saharien constantinois: M'chounèche prope Biskra, 3 June 1902 (fl), *Chevallier* Pl. Sah. Alg. 416 (K).

TUNISIA. Kroumerie, Nord-est and Cap Bon: *fide* Pottier-Alapetite (1979: 509). Dorsale: Zaghouan, 26 July 1854 (fl), *Kralik* 196 (BM, K). Centrale: sud de Sousa [Sousse], 8 June 1883 (fl), *Cosson* et al. s.n. (K).

LIBYA. Tripolitania: Misurata, 22April 1939 (fl), *Simpson* 39662 (BM), *Sandwith* 2719 (K).

MALTA. Malta: Corradino, Wied Kerdu, April-June 1929 (fl), *Reade* s.n. (BM); Qaliet, 21 May 1965 (fl), *Llanfranco* s.n. (BM).

SICILY. Trapani: Trapani, July 1908 (fl), *Albo* s.n. (BM). Palermo: Palermo, in campis maritimis, 1902 (fl & fr), *Ross* s.n. (BM).

SARDINIA (extinct?). Nuoro: prope Laconi, 1827 (fl), *Müller* s.n. (H) (see opposite).

CULTIVATED. England: London, Chelsea Physic Garden, 1767 (fl), *Herb. Chelsea* 2272 (BM).

H. pubescens is directly related to the Canary Island 1. *H. glandulosum* and appears to be ancestral to 8. *H. tomentosum*. Its distribution is south-west of that of *H. tomentosum*, but there are quite wide areas of overlap in south Spain, north-eastern Morocco and north-western Algeria. Morphological intermediates are few and apparently mainly confined to two small regions, viz. Valencia near L. Albufera and the Moroccan-Algerian border. In addition, the recorded chromosome numbers (*H. pubescens* 2n=18, 36; *H. tomentosum* 2n=16) suggest that they are specifically distinct. For these reasons it seems best to treat the intermediates as hybrids and *H. pubescens* and *H. tomentosum* as species.

Although *H. pubescens* is quite variable in size and habit, depending on humidity and exposure, at least one of the named variants is not worthy of recognition: var. *damnatorum* was based on the occurrence of purplish anthers, which was probably due to suffusion of hypericin from the anther gland. I have not seen the type of var. *viridulum*

7x. **Hypericum pubescens × tomentosum**
Map 34.

H. tomentosum var. *intermedium* Coss. [in *Bourgeau*, Exsicc. 1852: no. 1582 (1852) nomen] ex Willk. & Lange, *Prodr. fl. hispan.* **3**: 592 (1878); Sagredo, *Fl. Almeria*: 290 (1987). Types: Spain, Valencia, ad forsa inter Vivér et Jérica, August 1850 (fl), *Willkomm* Iter hisp. II 478 (BM!); in sabulosis pineti prope lacum Albufera, August 1850 (fl), *Willkomm* Iter hisp. II 506 (BM!); ad lacum Albufera, 1852, *Cosson* in *Bourgeau* Exsicc. 1852 No. 1582 (P-lectotype, selected here; K!).

H. tomentosum [var.] α *genuinum* subvar. *elevatum* Pérez Lara in *An. Soc. esp. Hist. nat.* **24**: 333 (1895), nom. illegit. superfl. Type as for *H. tomentosum* var. *intermedium* Coss.

?*H. tomentosum* [var.] β *ambiguum* Pérez Lara in *An. Soc. esp. Hist. nat.* **24**: 333 (1895). 'Type': Spain, Andalucía, Gades, *Pérez Lara*. No specimen; described from living plants.

Intermediate in form between the parents. Hair length as in *H. pubescens*. Inflorescence variable but usually nearer that of *H. tomentosum*. *Sepals* either narrowly lanceolate with small gland on the arista or broadly lanceolate to elliptic without apical gland, but always with marginal glandular cilia.

Spain (Valencia, Gerona), Morocco (Rif, Oranais littoral), Algeria (western Oran).

SPAIN. Valencia: Lac Albufera, July, *Graels* s.n. (BM). Gerona: Llers, 14 July 1907 (fl), *Sennen* 273 (FR, H, RNG).

MOROCCO. Rif: Hidum, 10 May 1930 (fl), *Sennen & Mauricio* sub 7542 (BM). (One sheet as above, the other (BM) unaltered as Tafersit, 28 June 1930 (fl), *Sennen & Mauricio* 7542). Oranais littoral: Martimprey-du-Kiss, à Aghbal, fl. 13 June 1931, *Faure* s.n. (BM). Moyen Atlas: Oulad Ali, 1950 m, 30 July 1975 (fl), *Stanes* 28050 (BM).

ALGERIA. Oran: prope Tlemcen, 18 June 1856 (fl), *Bourgeau* s.n. (BM).

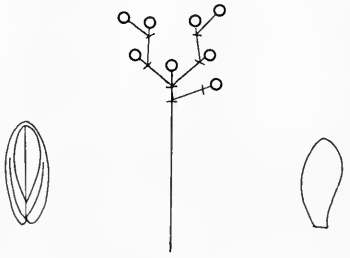
In addition, the only Sardinian specimen of *H. tomentosum* seen (q.v.) tends towards *H. pubescens*, and it seems probable that the populations of that species from southern Italy do likewise.

8. **Hypericum psilophytum** (Diels) Maire in *Bull. Soc. Hist. nat. Afr. Nord* **26**: 195 (1935), op. cit. **31**: 14 (1940); Jahand. & Maire, *Cat. pls Maroc*, Suppl.: 1070 (1941); Quézel & Santa, *Nouv. Fl. Algérie*, **2**: 682 (1963) ['*psilophyton*']; Greuter, Burdet & Long, *Med-Checklist* **3**: 273 (1986). Type: Algeria, Ahaggar Hochland, Seitental des Tig'ameiin-en-tisita, 24 April 1914 (fl), *Geyr* 272 (B†-holotype).
Map 33.

H. suberosum var. *psilophytum* Diels in *Bot. Jb.* **54**, Beibl. 120: 100 (1917).

H. tomentosum subsp. *psilophytum* (Diels) Maire in *Mém. Soc. Hist. nat. Afr. Nord* **3**: 154 (1933); Ozenda, *Fl. Sahara* 2nd ed.: 342, f. 117 (1977).

Icon: Ozenda, *Fl. Sahara* 2nd ed.: f. 117 (1977).



Perennial herb 0.1–0.5 m tall, tufted, decumbent to ascending from woody taproot, branching at base, upper branches few or absent, stems spreading- to appressed-puberulous, leaves papilliform-puberulous, inflorescence glabrous or almost so. *Stems* becoming purplish red, 2-lined near inflorescence, otherwise terete, internodes shorter than to exceeding leaves. *Leaves* sessile; lamina 5–13 × 2.5–

6 mm, ± narrowly oblong to oblanceolate, concolorous, chartaceous, not glaucous, plane, suberect; apex rounded, margin plane, entire, base rounded to subcordate-amplexicaul; venation: 2 pairs of laterals curved-ascending from lower 0.4 of midrib, tertiary reticulation obscure; laminar glands pale, rather dense, subequal, not prominent, with a few black, punctiform, scattered; intramarginal glands black, rather dense; marginal glands absent. *Inflorescence* 2–*c.* 25-flowered, from 1(2) nodes, curved-corymbose, monochasial after first flower or sometimes wholly monochasial, sometimes with 1–2 branches; pedicels 1.5–3 mm; bracteoles linear, black-glandular-ciliate. *Flowers c.* 15 mm in diam., stellate; buds ellipsoid-subglobose, subacute. *Sepals* 2–4 × 1–1.2 mm, lanceolate or elliptic to narrowly oblong, subequal, acute to shortly aristate, margin glandular-ciliate; veins 3, unbranched; laminar glands pale, shortly linear to punctiform, sometimes also black, punctiform; marginal glands black, sessile or on short cilia, apex glandular. *Petals* yellow, tinged red dorsally, 7–8 × *c.* 3 mm, 2 × sepals, oblanceolate to narrowly elliptic-oblong?, rounded, apiculus absent; laminar glands pale, striiform to punctiform; marginal glands black (?). *Stamens c.* 15–25, 3?-fascicled, longest 4–5 mm, *c.* 0.65 × petals; anther gland black. *Ovary c.* 2 × 1 mm, narrowly ovoid; styles 3, *c.* 2.5–3 mm, 1.25–1.5 × ovary, spreading (-incurved?). *Capsule* 3.5–4 × 2.5 mm, ovoid to ovoid-subglobose, 1.5–2 × sepals. *Seeds* not seen; testa striate (*fide* Ozenda). 2n=18 (Reynaud, 1986).

Damp margins of wadis; *c.* 800–2040 m.

Morocco (Grand Atlas, western Sahara), Algeria (Teffedest, Ahaggar, Tassili n'Ajjer).

MOROCCO. Grand Atlas: Gorges du Todha [Todrha], 1500 m, 23 June 1939 (fl), *Maire & Weiller* 473 (AL*, P). Maroc désertique occidental: Djebel Bani àTatta, 8 April 1934 (o. fr), *Maire & Wilczek* It. Maroc. XXIV s.n. (AL*, P).

ALGERIA. Sahara septentrional. Teffedest: *fide* Quézel & Santa (1963). Ahaggar: Tazerouk, 1950 m, 1928, *Maire* 262 (AL*); Oued Tessekimt, 2040 m, 1928, *Maire* 262 (AL*); ibid., 1400–1500 m, 1928, *Maire* 263 (AL*). Tassili n'Ajjer: valley of Oued Tidjamain-n-Tisita, 800–900 m, 29 April 1914 (fl), *Geyr* 272 (B†).

H. psilophytum is most closely related to 7. *H. pubescens* rather than to 9. *H. tomentosum*, the relationship favoured by Maire (1933). In particular it is near the reduced forms of *H. pubescens* from the Anti-Atlas of Morocco. It is not far geographically, morphologically or ecologically from these to the Moroccan populations of *H. psilophytum*, which occur on the south-western parts of the Jebel Bani and Grand Atlas, next to the Sahara.

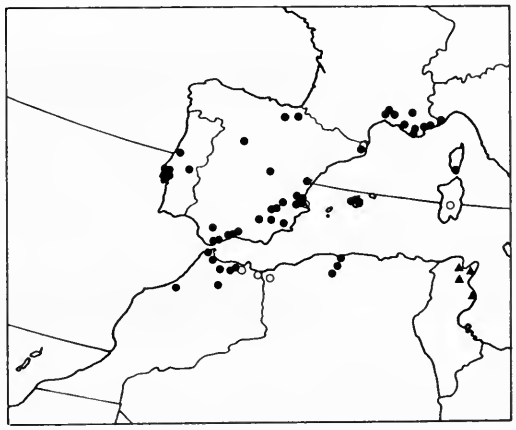
H. psilophytum appears to be a good species, differing from *H. pubescens* in several characters including the shorter, mostly appressed indumentum, the smaller, sometimes glandular-ciliate sepals and the glabrous or slightly puberulous inflorescence. From the literature the (isolated) Algerian populations would seem to be more distinct than the Moroccan ones.

9. **Hypericum tomentosum** L., *Sp. pl.*: 786 (1753); Willd., *Sp. pl.* **3**: 1466 (1802); Choisy, *Prodr. monogr. Hypéric.*: 52 (1821), in DC., *Prodr.* **1**: 551 (1924); Moris, *Fl. Sardoa* **1**: 322, t. 21 (1837) pro parte excl. ref. Decaisn.; Rchb., *Ic. fl. germ. helv.* **6**: t. 346, f. 5183 (1844); Ball in *J. Linn. Soc. London* (Bot.) **16**: 374 (1877), pro parte quoad spec. ex Tangier; Willk. & Lange, *Prodr. fl. hispan.* **3**: 592 (1878), *Suppl.*: 272 (1893); Batt. & Trab., *Fl. Algérie*, Dicots. **1**: 183 (1888); Bonnet & Baratte, *Expl. sci. Tunisie, Cat. pl.*: 74 (1896); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925), pro parte; Cout., *Fl. Portugal* 2nd ed.: 483 (1930); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 4 f. 22 (1932), **11**: 174 (1933), pro parte excl. distr. ital. merid. et Sicilia et Melita, **12**: 87 (1934), in *Pflanzenareale* **4**(1): Karte 6a (1933); Jahand. & Maire, *Cat. Pls Maroc* **3**: 485 (1934); Sennen & Mauricio, *Cat. fl. Rif oriental*: 26 (1934); Samp., *Fl. Portugueza* 2nd ed.: 323 (1946); N. Robson in Tutin et al., *Fl. europaea* **2**: 266 (1968); Franco, *Nova Fl. Portugal* **1**: 450 (1971); Fournier, *Quatre Flores de France* 2nd ed.: 456 (1977); Barceló, *Fl. Mallorca* **3**: 178 (1979, reprint 1990); Pott.-Alap., *Fl. Tunisie*: 509 (1979), pro parte quoad subsp. *eutomentosum* Maire; Pignatti, *Fl. Italia* **1**: 347 (1983); Ramos in *Trab. Depto Bot. Univ. Complut* **12**: 54, t. 6 f. 1 (1982); Greuter, Burdet & Long, *Med-Checklist* **3**: 273 (1986); Ramos in *Acta bot. Malacit.* **11**: 169, f. 9a (1986), in Valdés, Talavera & Fern.-Gonz., *Fl. vasc. Andalucía occ.* **1**: 317 (1987), in Castroviejo et al., *Fl. iberica* **3**: 184 (1993); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72 (1995). Type: The Linnaean phrase-name clearly describes *H. tomentosum* rather than *H. pubescens* Boiss. Following Clusius and Bauhin, Linnaeus differentiated a smaller French plant (*H. supinum tomentosum minus & monspeliacum* of Bauhin) from a larger Spanish one (*H. supinum tomentosum majus & hispanicum* of Bauhin), the latter as a var. β. From Clusius (*Rar. pl. hist.* **2**: 181, 1601) it is clear that these are both forms of *H. tomentosum*. There are three specimens of this species that Linnaeus studied, two in his own herbarium (LINN 943.42 and 43) and one in Herb. Burser (UPS **16**: 23). Specimen 943.42 is labelled *Hypericum supinum majus hispanicum* and was given to Linnaeus by Monnier; 943.43 is a typical young-flowered plant of the northern, French form, the collector being unknown; and the Burser plant is a fruiting specimen from Montpellier. Of the two specimens of the French form, I therefore select the flowering one (LINN 943.43) as the lectotype of *H. tomentosum* L.

Fig. 26B, Map 34.

H. lusitanicum Poir., *Encycl.*, Suppl. **3**: 702 (1814); Choisy, *Prodr. monogr. Hypéric.*: 57 (1821), in DC., *Prodr.* **1**: 553 (1824); Willk. & Lange, *Prodr. fl. hispan.* **3**: 592 (1878); Debeaux in *Act. Soc. Linn. Bordeaux* **42**: 164 (1889); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 1 f. 16 (1932), **11**: 175 (1933), **12**: 87 (1934), in *Pflanzenareale* **4**(1): Karte 6a (1933); Samp., *Fl. Portugueza* 2nd ed.: 323 (1946). Type: Portugal, *Anon.* in Herb. Desfontaines (P-lectotype, selected here); *Hypericum tomentosum, lusitanicum, minimum* Tournefort, *Inst. R. Herb.*: 256 (1700) (P-syntype).

H. suberosum Salzm. ex Boiss., *Voy. bot. Espagne* **2**: 115 (1839) in synon.; Bonnet & Barratte, *Expl. sci. Tunisie, Cat. pl.*: 74 (1896), nomen. 'Type': Morocco, Tangier, *Salzmann* s.n. (C).



Map 34 Sect. 27: 9. *H. tomentosum* specimens ●, Tunisian records ▲ (Pottier-Alapetite, 1979); 7. *H. pubescens* × 9. *H. tomentosum* ○.

H. supinum Vis. in *Atti Riun. Sci. ital.*: 175 (1841), *Ill. piante Grec. Asia minore*: 17 (1842); N. Robson in *Notes R.B.G. Edinb.* **27**: 196 (1967); Mabberley in *Taxon* **31**: 71 (1982). Types: (i) as for *H. tomentosum* L. [var.] β, *Sp. pl.* 2nd ed.: 1106 (1763) – lectotype, Robson (1967*a*); (ii) Turkey, circa Antandro ad sinum Golfo d'Adramitti dictum 1819, *Parolini & Webb* (PAD!-syntype). Robson (1967*a*) showed that de Visiani's clear intention was to raise Linnaeus's *H. tomentosum* [var.] β to specific rank and to include the Turkish specimen (from Edremit) in that species. The Turkish specimen belongs to 21. *H. atomarium*, but the lectotype must be that of *H. tomentosum* [var.] β L., i.e. LINN 943.42 (see discussion under *H. tomentosum*).

H. tomentosum var. *dissitiflorum* Roemer in *Linnaea* **9**: 17 (1852); Willk. & Lange, *Prodr. Fl. hisp.* **3**: 592 (1878); Cout., *Fl. Portugal* 2nd ed.: 483 (1939). Type: Spain, Jaen, Sierra Morena, inter Aldeaquemada et S. Esteban, *Willkomm* (COI-holotype).

?*H. canescens* Trevir., *Hyper. sp. animadv.*: 10 (1861). Type: Stefanoff (1934: 87) made this a synonym of *H. lusitanicum* Poiret, and Treviranus suggested that it might be a prostrate form of that species. He stated, however, that the fruit [of the type specimen, now in BHU?] had been destroyed. The identity of this taxon must therefore remain *sub judice*.

Adenosepalum tomentosum (L.) Fourr. in *Ann. Soc. Linn. Lyon* N.S., **16**: 352 (1868).

H. tomentosum var. *glabrescens* Porta in *Nouv. Giorn. bot. ital.* **19**: 301 (1887), nomen. 'Type': Balearic Is., Mallorca, prope pagum Artá, 10–20 m, 30 June 1885 (fl), *Porta & Rigo* s.n. (BM!).

H. tomentosum var. *racemosum* Batt. in Batt. & Trab., *Fl. Algérie*, Dicots.: 183 (1888); Cadevall Gotés, *Fl. Catalunya* **1**(4): 379 (1915). Type: Algeria, ? (AL).

H. tomentosum var. *palustre* Batt. in Batt. & Trab., *Fl. Algérie*, Dicots.: 183 (1888). Types: Algeria (Boufarik, Maison-Carreé, etc.) (AL-syntypes).

H. tomentosum subsp. *lusitanicum* (Poir.) Willk. in Willd. & Lange, *Prodr. fl. hispan.*, Suppl.: 272 (1893).

H. tomentosum [var.] α *genuinum* Pérez Lara in *An. Soc. esp. Hist. nat.* **24**: 332 (1895). Type as for *H. tomentosum* L.

H. tomentosum [var.] γ *lusitanicum* (Poir.) Pérez Lara in *An. Soc. esp. Hist. nat.* **24**: 333 (1895).

H. tomentosum subsp. *eu-tomentosum* Maire, *Cat. Pls Maroc* **2**: 485 (1932). Type as for *H. tomentosum* L.

H. tomentosum subsp. *carbonelli* Sennen & Mauricio, *Cat. fl. Rif orient.*: 26 (1934), nomen.

H. carbonelli Sennen & Mauricio [*Campagn. bot.*: 105 (1936) in obs., nomen] *Diagn. nouv.*: 185 (1936). Type: Morocco, Rif, Tarquist, Bab-Izugar, 1926, *Emberger & Maire* s.n. (BC-holotype).

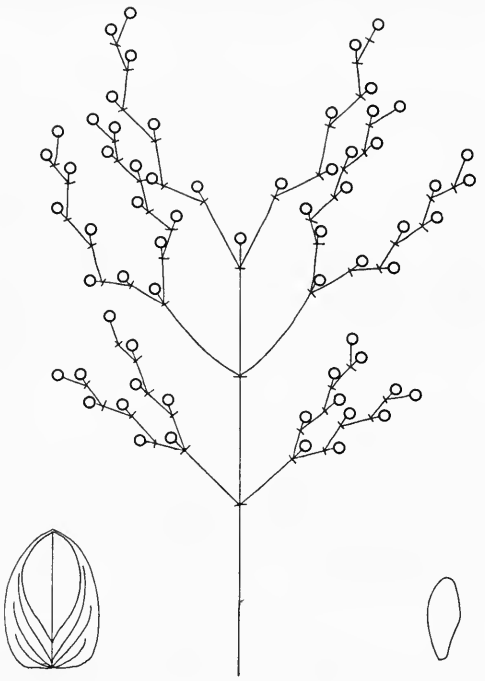
H. tomentosum subsp. *eu-tomentosum* var. *carbonelli* (Sennen & Mauricio) Maire in *Bull. Soc. Hist. nat. Afr. Nord* **27**: 216 (1936). Type as for *H. carbonelli*.

H. tomentosum subsp. *wallianum* Maire in *Bull. Soc. Hist. nat. Afr. Nord* **27**: 79 (1936), in tom. cit.: 216 (1936); Jahand. & Maire, *Cat. Pls Maroc*, Suppl.: 1071 (1941). Type: Morocco, Grande Atlas oriental près de Rich, May (fl), *Wall* (AL?-holotype).

H. tomentosum var. *densifolium* Sennen (description not traced). Type: Spain, Murcia, Sierra de Espuña, Coto de Sta Eulalia, 21 June 1927 (fl), *Jerónimo* in *Sennen*, Pls d'Espagne 6419 (BC-holotype; BM!-isotype).

H. tomentosum var. *ramosissimum* Sennen (description not traced). Type: Spain, Murcia, Sierra de Espuña a Sta Eulalia, 480 m, 8 July 1929 (fl), *Sennen & Jerónimo* s.n. (BC-holotype; BM!-isotype).

Icones: Rchb., *Ic. fl. germ. helv.* **6**: t. 346 (1844); Bonnier, *Fl. ill. France* **2**: t. 104 (1912).



Perennial herb c. 0.09–0.53 m tall, erect or decumbent to prostrate, from scarcely woody taproot, branching and sometimes rooting at base, upper branches sometimes present in some or all axils, spreading to ascending, the whole plant up to sepals (dorsally) greyish villous to -tomentose or leaves hirsute to crisped-pubescent. *Stems* green, terete, internodes mostly exceeding leaves. *Leaves* sessile; lamina 5–26 × 2–11 mm, elliptic-oblong to oblong or oblanceolate or ovate to triangular-ovate, concolorous, chartaceous, not glaucous, plane, spreading; apex rounded, margin plane, entire, base cuneate to truncate or subcordate; venation: 3 pairs of laterals curved-ascending from lower 0.3–0.4 of midrib, tertiary reticulation obscure; laminar glands pale, dense, unequal, not prominent; intramarginal glands black, rather dense to sparse, sometimes irregular and becoming submarginal, or absent (then black glands wholly absent). *Inflorescence* 3–*c.* 70-flowered from up to 3 nodes, curved-corymbiform to cylindric, with flowering branches from up to most lower nodes, the whole then cylindric; pedicels 0.5–2 mm, elongating to 5–8 mm in fruit; bracts not auriculate, bracteoles linear, with apex and margin black-glandular-ciliate. *Flowers* 10–15(–20) mm in diam.; buds ellipsoid, obtuse to rounded-obtuse. *Sepals* 3–5(–6?) × 1–2.5 mm, subequal to unequal, lanceolate to ovate or broadly elliptic, acute to usually shortly aristate, with marginal glands mostly prominent; veins 3–5, unbranched; laminar glands pale, punctiform to slightly elongate, sometimes also 1–3 black, submarginal; marginal glands black, *c.* 8–16 on each side, on cilia or sessile but then nearly always prominent, the apex usually with larger gland. *Petals* bright yellow, not tinged or veined red, 6–11 × 2.5–3.5(–4?) mm, *c.* 2 × sepals, oblanceolate, rounded, apiculus lateral, shortly acute to absent; laminar glands pale, proximally linear, distally striiform to punctiform; marginal to inframarginal glands black, few, subterminal, not prominent. *Stamens c.* 25–35, clearly 3-fascicled, longest 5–7 mm, 0.6–0.8 × petals; anther gland black. *Ovary* 1.5–2 × 1–1.3 mm, narrowly ovoid-pyramidal; styles 3, 5–5.5 mm, 2.75–3.3 × ovary, widely spreading-incurved. *Capsule* 4–5 × 3–3.5 mm, ovoid-subglobose, shorter than sepals, enclosed by petals twisting together. *Seeds* 'greyish-brown' (*fide* Ramos, 1987), *c.* 0.8 mm long; testa finely reticulate-scalariform (*fide* Ramos, 1983: 57, t. 6 f. 1). 2n = 16 (Queiros, 1991), n = 8 (Nielsen, 1924).

Stream margins, damp or marshy grassland, maquis, evergreen scrub; 0–200 m (France), 0–800 m (Italy), 0–1200 m (Spain), 0–1450 m (Morocco).

Portugal (N. to Coimbra), Spain (except NW), France (Mediterranean lowlands), Italy (Liguria, also Campagnia and Basilicata *fide* Pignatti, 1982), Corsica (one locality, extinct?, *fide* Gamisans, 1985), Sardinia, Majorca, Morocco (Tangíer, Rif, northern Moyen Atlas), Algeria (north), Tunisia (north).

PORTUGAL. Coimbra: Estrada Coimbra-Cantanhede, entre São Fagundo e Ançã, 20 September 1956 (fl), *A. & R. Fernandes & Matos* 6120 (BM, COI*). Leiria: Caldas da Rainha, 2 July 1889, *Murray* s.n. (BM). Santarém: Estrada Abrantes-Sardoal à 3 km de Sardoal, 18 June 1956 (fl), *A. & R. Fernandes & Santos* 5837 (BM, COI*). Lisboa: Estoril district, 1939 (fl), *Ogilvie* 18 (K). Setúbal: ad pedem Serrae da Arrabida, June 1842 (fl), *Welwitsch* 189 (K); Arrabida, April 1987 (st), *Bowen* 5018 (RNG).

GIBRALTAR. Near Gibraltar, Campomento, May 1868 (fl), *Hirst* 23 (BM).

SPAIN. Cadiz: 2 km S. of El Bosque, 400 m, 12 July 1981 (fl), *M. & S. Gardner* 1126 (BM, RNG). Sevilla: between Carmona and Seville, 20 June 1927 (fl), *Wilmott* s.n. (BM). Málaga: Cartama, 2 July 1888 (fl), *Reverchon* 69 (BM, K); *c.* 4 km NE of Archidona, 10 June 1964 (e. fl), *Sandwith* 6312 (K). Granada: Nevada ad pedem Mt Domago, 22 July 1873 (fl), *Winkler* s.n. (BM). Jaén: Sierra de Cazorla, Cueva del Polvo, 1050–1200 m, 28 July 1951 (fl), *Heywood* 1772 (BM). Albacete: Sierra de Segura, 15 km W. of Yeste, 1.5 km E. of Prados, 1000 m, 30 June 1979 (fl), *Reading U./Bot. Dept. Exped.* 563 (BM, RNG). Murcia: Sierra de Espuña, Coto de Sta Eulalia, 21 June 1927 (fl), *Jeronimo* in *Sennen* 6419 (BM). Valencia: Dos Aguas, 15 May 1984 (fl), *Peris & Stübing* Exsicc. II 48 (K, RNG). Cuenca: Serrania de Cuenca, 16 July 1967 (fl), *Rivas-Goday & Morja* (RNG, MAF*). Valladolid: Olmedo, 28 June 1851–2 (fl), *Lange* s.n. (K). Burgos: Miranda, 30 July 1909 (fl), *Elias* 806 (BM). Navarra: environs de Lumbier, entre Artieda et Ripodas, *c.* 500 m, July 1972 (fl), *Vivant* in *Anquier* Exs., Fasc. 15, 6722 (H). Teruel: Valacloche, 800 m, July 1893 (fl), *Reverchon* 626 (BM, FR). Barcelona: Castelloglels, 12 June 1920 (fl), *Sennen* s.n. (K). Gerona: Llers, 1 August 1907 (fl), *Sennen* 422 (FR, H, RNG).

FRANCE. Hérault: Murviel les Montpellier, 14 July 1895 (fl & fr), *Mandon* s.n. (BM). Bouches du Rhône: Meyreuil, entre le pont de Bayou et Beaureceuil, 27 June 1912 (fl), *Delmas* 19 (BM). Vaucluse: Avignon, Rignien, n.d. (fl & fr), *Bentham* s.n. (K). Var: Le Cannet-des-Maures, 10 July 1950 (fl), *Bouchard* in *Exsicc. B. de Retz* fasc. 5, 1656 (K). Alpes Maritimes: Nice à St André, June 1894 (fl), *Bonafons* s.n. (BM).

ITALY. Liguria: Bordighera, Val di Sasso, 3 July 1890 (fl), *Bicknell* s.n. (BM, K). Also recorded from Campagnia and Basilicata (see opposite).

CORSICA. Near Bonifacio, *Pouzolz* 'in Hb. Bor.', *fide* Briquet (1935).

SARDINIA. Nuoro: ad rivulis prope Laconi, July 1827 (fl), *Müller* s.n. (H, K). This specimen shows characters verging towards *H. pubescens* (see p. 184).

BALEARIC ISLANDS. Majorca: Puigpunyent, *c.* 1.5 km S. of Puigpunyent towards Galilea, 340 m, 14 July 1969 (fl), *L. & I. Ferguson* 2491 (BM); Alcudia, between Mal Pas and Barcarets, 9 August 1987 (fl & fr), *J. & M. Cannon* 3363 (BM); Puerto Pollensa, near sea level, 27 November 1934 (fl & fr), *Martindall* 79 (K).

MOROCCO. Tanger: Tanger to Sebta (Ceuta), 5 km, 70 m, 18 June 1987 (fl), *Jury, Rejdali & Watson* 8301 (BM, RNG); Tetouan, 450 m, 21 June 1977 (fl), *Lewalle* 8762 (BM, BR*). Rif: between Ketama and Taounate, 134 km from Fez, 1300–1400 m, 8 July 1973 (fl), *Davis* 54967 (BM); Atlas Rifain: Beni-Bufrah, 1300 m, 19 June 1934 (fl), *Sennen & Mauricio* 9642 (BM).

ALGERIA. Alger: between Boufarik and Kolea, *c.* 40 m, 28 June 1975 (fl), *Davis* 59519 (BM); gorges de la Chiffa, vers de Camp des Chênes, 12 June 1875 (fl), *Cosson* s.n. (K).

TUNISIA. No specimens seen. Recorded from north and down eastern plain to Sidi el Hani and Mahdia by Pottier-Alapetite (1979).

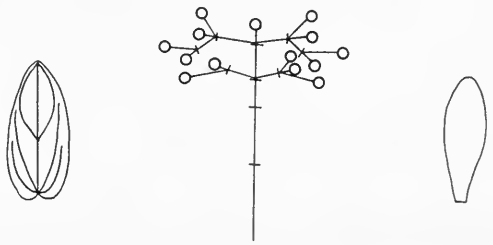
H. tomentosum tends to be smaller in all its parts than 7. *H. pubescens* and to have shorter hairs; but (i) the south Moroccan populations of *H. pubescens* are vegetatively smaller than many examples of *H. tomentosum*, although the flowers are still relatively large, and (ii) the populations of *H. tomentosum* from the Atlas Rifain of northern Morocco described as *H. carbonelli* have an unusually long indumentum. None of the described variations in *H. tomentosum*, however, appears to merit taxonomic recognition. For intermediates between *H. tomentosum* and *H. pubescens*, see Sp. 7x (p.184).

The reasons for treating *H. tomentosum* and *H. pubescens* as distinct species are discussed on p. 184. *H. tomentosum* has a mainly west Mediterranean distribution, from NE Morocco and NW Algeria to Liguria with Majorca and Corsica; *H. pubescens* has a south-west Mediterranean distribution, south Morocco to SE Spain, Tunisia, Malta and Sicily. Where these distributions meet (Sardinia) or overlap (Morocco-Algeria border, SE Spain), there are intermediates (hybrids). The records from southern Italy would therefore be expected to be of *H. pubescens*, but they are in fact of *H. tomentosum* (Pignatti, 1982). Pignatti (in litt. 1991) has informed me that the Basilicata record (from Monte Vultura) is based on an old specimen of Terraciano (in FI?), which I have yet to see. The record(s) of *H. tomentosum* from Campania are similarly doubtful, as are those from Tunisia (Pottier-Alapetite, 1979).

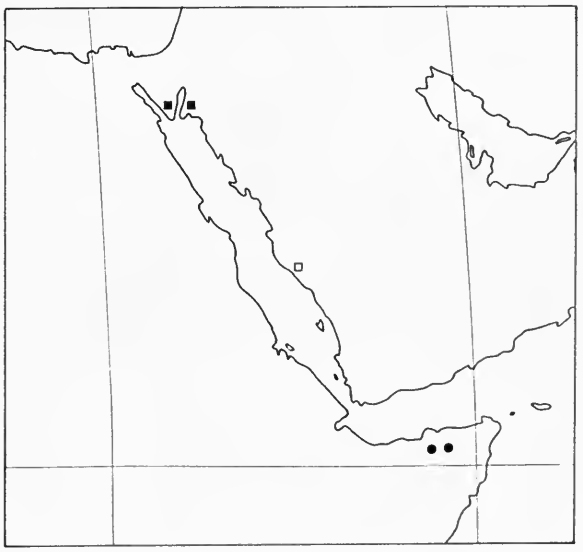
10. **Hypericum somaliense** N. Robson in *Kew Bull.* **13**: 396 (1959); Cufod. in *Bull. Jard. bot. État. Brux.* **29**, Suppl.: 589 (1959), Moggi & Pisacchi in *Webbia* **2**: 277, f. 14, carta 6 (1967). Type: Somalia (North): Markat, 1440 m, 12 August 1957 (fl), *Newbould* 886 (K!-holotype).

Map 35.

Icon: Moggi & Pisacchi in *Webbia* **22**: 279, f. 14 (1967).



Perennial herb 0.15–0.6 m tall, erect or decumbent to ascending and rooting at base, from ± woody taproot, upper branches sometimes present, ascending, the whole plant up to the bracteoles whitish



Map 35 Sect. 27: 10. *H. somaliense* ●; 11. *H. collenettiae* □; 12. *H. sinaicum* ■.

tomentose. *Stems* green to pale red-brown, terete, internodes mostly exceeding leaves. *Leaves* sessile; lamina 10–18(–23) × 4–9 mm, narrowly oblong to triangular-ovate or triangular-lanceolate, almost concolorous, chartaceous, not glaucous, plane, spreading; apex obtuse to apiculate or rounded, margin plane, entire, base rounded to subcordate-amplexicaul; venation: 2–3 pairs of laterals curved-ascending from lower 0.2–0.4 of midrib, tertiary reticulation obscure; laminar glands pale, dense, unequal, not prominent; intramarginal glands black, rather dense. *Inflorescence c.* 10–30-flowered from 1–2 nodes, subcorymbiform to capitate-rounded, rather dense, with sparse amber glands, not prominent, without lower flowering branches; pedicels 2.5–4.5 mm in fruit; bracts not auriculate; bracteoles linear-triangular, with margin black-glandular-ciliate. *Flowers c.* 15 mm in diam.; buds ellipsoid, acute. *Sepals* 2–5 × 1.5–2 mm, equal, lanceolate, to ovate, acute to aristate, glandular-ciliate to -fimbriate; veins 5(–7), unbranched; laminar glands pale, linear to punctiform; marginal glands black; marginal and apical glands black, smaller. *Petals* orange-yellow, not red-tinged, 7–9 × *c.* 2–3 mm, *c.* 2–3.5 × sepals, oblong-lanceolate?, rounded, with apiculus acute, short; laminar glands pale, linear to striiform; marginal glands black, sessile, ± prominent. *Stamens c.* 30, clearly 3-fascicled, longest 6.5–8 mm, *c.* 0.9 × petals; anther gland black. *Ovary c.* 2 × 1 mm, ovoid-conic; styles 3, *c.* 6 mm, *c.* 3 × ovary, spreading-incurved. *Capsule* 4.5–5.5 × 2.5–3 mm, narrowly ovoid, exceeding sepals, not enclosed by separately twisting petals. *Seeds* dark reddish brown, 0.5 mm long; testa finely scalariform-reticulate.

Streamsides, clay flushes; 1440 m.

Somalia (North).

SOMALIA. Ragad, 1440 m, 12 August 1957 (fl), *Newbould* 895 (K).

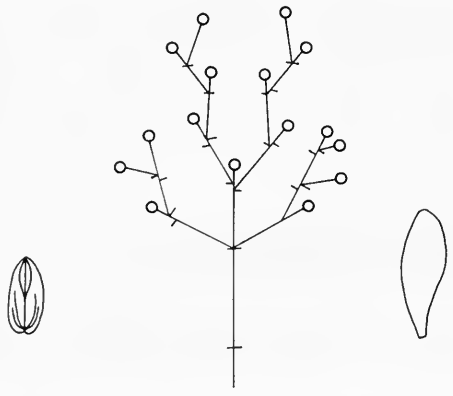
Only the above two collections have been made of *H. somaliense*, which thus appears to be a relict species of very restricted distribution. Its relationships are clearly with 7. *H. pubescens*, from which it differs by the dense, mostly glabrous inflorescence and the glandular-ciliate to -fimbriate sepals with a row of submarginal black glands.

11. **Hypericum collenettiae** N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 69 (1993). Type: Saudi Arabia, Asir, Taif-Abha road 82 km S. of Baljurshi, Wadi Mahra, 1800 m, 5 August 1982 (fr), *Collenette* 3752 (BM!-holotype; K!-isotype).

Fig. 26C, Map 35.

H. sp. aff. *sinaicum* sensu Collen., *Ill. guide fls Saudi Arabia*: 262 & photographs (1985).

Icon: Collen. (1985), see above.



Perennial herb or subshrub, *c.* 0.15–0.2 m tall, erect from woody taproot or decumbent at base and rooting, often with short ascending branches below inflorescence, the whole plant up to the inflorescence ± densely white-puberulous. *Stems* green to purplish red, terete, internodes mostly shorter than leaves. *Leaves* sessile, markedly tetrastichous; lamina 7.5–*c.* 13 × 1.5–4 mm, narrowly oblong to (upper) triangular-lanceolate, concolorous, chartaceous, appearing greyish blue but not glaucous, plane, spreading; apex obtuse, margin plane, entire, base rounded to subcordate; venation: 2 pairs of laterals curved-ascending from lower *c.* 0.25 of midrib, tertiary reticulation not seen; laminar glands pale, dense, unequal, not prominent; intramarginal to submarginal glands black, rather sparse. *Inflorescence* (1–)5–*c.* 11-flowered, from 1(2) nodes, subcorymbiform to rounded-pyramidal when flowers numerous, rather lax, without lower flowering branches; pedicels 3–7 mm in fruit, with ± prominent reddish glands; bracts not auriculate; bracteoles linear-lanceolate, with margin black-glandular-ciliate. *Flowers c.* 25 mm in diam.; buds ellipsoid, acute. *Sepals* 3.5–4 × 0.8–1.2 mm, equal, ± narrowly lanceolate, acute to subaristate, irregularly glandular-ciliate or with prominent sessile glands; veins 5, outer branched; laminar glands pale, linear to striiform and (toward margins) black, punctiform to striiform; marginal and apical glands black, smaller. *Petals* golden yellow, not red-tinged, 9–10(?–12) × *c.* 4.5–5 mm, *c.* 2.5 × sepals, oblong-obovate, truncate, with apiculus obtuse, short; laminar glands distal, pale, shortly striiform to punctiform and black, ± elongate-punctiform, toward apex, marginal or inframarginal glands black, few, elongate-punctiform. *Stamens c.* 40, clearly 3-fascicled, longest 5–6 mm, *c.* 0.6 × petals; anther gland black. *Ovary c.* 2 × 1.5 mm, ovoid-pyramidal; styles 3, *c.* 4 mm long, *c.* 2 × ovary, widely spreading. *Capsule* 4.5–5 × 3–4 mm, ovoid-cylindric, exceeding sepals, enclosed by petals twisting together. *Seeds* dark red-brown, 0.7 mm long; testa finely scalariform-reticulate.

Shady rock crevices; *c.* 1800 m.

Saudi Arabia (Asir).

SAUDI ARABIA. Asir: Taif-Abha road, 70 km S. of Baljurshi, Wadi Mahra, 1829 m, 16 April 1979 (fl), *Collenette* 1401 (K); Bashwat [between Baha and Abha], 9 August 1975 (l. fl), *A. El-Sheikh* in Herb. KSUH 1067 (KSUH-photograph).

H. collenettiae is intermediate geographically and in most respects morphologically between 10. *H. somaliense* and 12. *H. sinaicum*. As in *H. somaliense*, the stems are erect and apparently not rooting; the leaves and indumentum are nearer those of *H. sinaicum*, as is the relatively lax and few-flowered inflorescence. In having black laminar petal-glands it also resembles *H. sinaicum*, but in its red-glandular pedicels it is nearer to *H. somaliense*. The prominence of these glands, however, distinguishes it from both species.

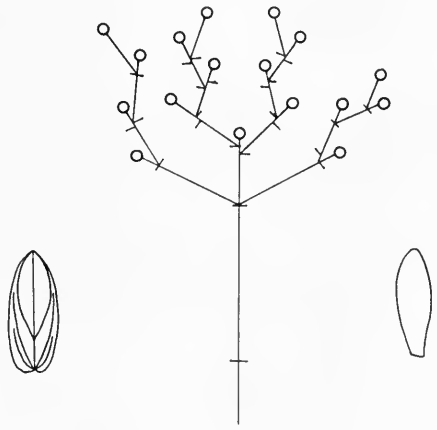
H. collenettiae is known as yet from only two populations and is therefore, like *H. somaliense*, a relict species. According to Mrs Collenette (verb. comm.), the Baljurshi population may no longer exist.

12. **Hypericum sinaicum** Hochst. [in Steud., *Nomencl. bot.* 2nd ed. **1**: 789 (1840), nomen] ex Boiss., *Fl. orient.* **1**: 808 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Post, *Fl. Syria* 2nd. ed., **1**: 233 (1932); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 29 (1932), **11**: 163 (1933), **12**: 85 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Montasir & Hassib, *Ill. man. Fl. Egypt* **1**: 309 (1956); Täckh., *Students' Fl. Egypt* 2nd ed. **1**: 150, t. 42B (1974); Greuter, Burdet & Long, *Med.-Checkl.* **3**: 273 (1986). Type: Egypt, Sinai, 'in rupibus ad scaturigines reg. Bestan ad rad. m. Sinai', 3 July 1835 (fl & fr), *Schimper* 421 (G-holotype; BASBG!, E!, JE!, K!, LE!-isotypes), sphalm 42 (Boiss.).

Fig. 26D, Map 35.

H. tomentosum sensu Decne. in *Annls Sci. nat.* (Bot.) II, **3**: 287 (1835).

Icon: Täckh., *Students' Fl. Egypt* 2nd ed. **1**: 151, t. 42B (1974).



Perennial herb 0.1–0.35 m tall or long, ascending to prostrate from woody taproot, with ± numerous near-basal branches sometimes rooting, otherwise unbranched below inflorescence, the whole plant except pedicels and flowers densely to sparsely and shortly whitish pubescent. *Stems* green to reddish, terete, internodes exceeding leaves. *Leaves* sessile or with petiole to *c.* 0.3 mm; lamina 6–18 × 3–8 mm, narrowly oblong to elliptic or (lower) oblanceolate, almost concolorous, thinly chartaceous, not glaucous, plane, spreading to ascending; apex obtuse to rounded, margin plane, entire, base broadly cuneate to subcordate; venation: 2–3 pairs of laterals curved-ascending from lower 0.3–0.6 of midrib, tertiary reticulation obscure; laminar glands pale, rather dense, unequal, not prominent, and black, few, scattered, especially towards apex; intramarginal glands black, rather sparse, or absent; submarginal glands black, sparse, not always distinguishable from black laminar ones. *Inflorescence c.* 3–20-flowered from 1–2(3) nodes, corymbiform to rounded-pyramidal; pedicels 2.5–3.5(–4) mm in fruit; bracts not auriculate; bracteoles lanceolate or oblong to linear, with apex and margin sparsely black-glandular-ciliate or some glands sessile. *Flowers* 9–13 mm in diam.; buds broadly ellipsoid, obtuse to rounded. *Sepals* 3–3.5 × 1–2 mm, subequal, ovate or ovate-elliptic to suborbicular, acute to obtuse, with marginal glands dense to sparse, on cilia or sessile and ± prominent; veins 5, unbranched; laminar glands pale, linear or long striiform to punctiform, and a few black, submarginal and occasionally truly laminar; marginal and apical glands black, *c.* 8–12 on each side. *Petals* pale yellow, sometimes veined red, (5–)8–10 × (1.7–)2–3 mm, 2–3 × sepals, oblong-lanceolate, rounded, apiculus absent; laminar glands distal, pale to reddish, striiform to punctiform, and sometimes a few black, punctiform; marginal glands black, distal, sessile or on short cilia. *Stamens* 25–30, clearly 3-fascicled, longest 4–6.5 mm, 0.55–0.8 × petals; anther gland black. *Ovary* 1.5–2 × *c.* 1 mm, ovoid-pyramidal to ovoid; styles 3, 2.5–4.5 mm, 1.7–2.2 × ovary, spreading. *Capsule* 4–5 × 2–3 mm, ovoid, exceeding sepals, enclosed by petals twisting together. *Seeds* dark reddish brown, *c.* 0.5 mm long; testa finely scalariform-reticulate.

Damp rocks and seepage areas; 900–2400 m.

Egypt (Sinai), Saudi Arabia (extreme N. Hijaz), Jordan (Edom).

EGYPT. Sinai: June 1832 (fl), *Bové* 152 (E, K); n.d. (fl), *Aucher* 868 (K); Mt Sinai, May 1868 (o. fr), *Lord* s.n. (K); n.d. (fl), *Kaiser* 115, 288, 536 (Z); Jebel Katarina, 1800–2400 m, September 1945 (fr), *Lord Kinross* s.n. (E).

SAUDI ARABIA. Hijaz: Wadi Lauz [Lawz] area near Aqaba, 91 km NE of Al Bud, 1500 m, 8 July 1991 (fr), *Collenette* 7840 (K); Jabal Lauz, Wadi Lakus, 900 m, 3 August 1989 (fl), *Collenette* 7231 (BM, E, K); Jabal Lauz area near Wadi Abyad, S. of Ha, 21 May 1990 (fl), *Collenette* 7589 (E*, K).

H. sinaicum is close to 11. *H. collenettiae* from Asir, but is less woody at the base, with stems ascending to prostrate (not erect), leaves broader (sometimes petiolate) and flowers smaller with shorter and broader sepals. In addition, the pedicels lack the prominent reddish glands found in *H. collenettiae*.

Collenette 7231 has delicate slender stems, leaves sometimes shortly petiolate and relatively small flowers and broad sepals with sessile marginal glands. Otherwise it seems to fit well into *H. sinaicum*, its abnormalities being the result of its growing in a particularly wet habitat.

Subsect. 3. **Caprifolia** N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 69 (1993). Type: *H. caprifolium* Boiss. (see p. 90).

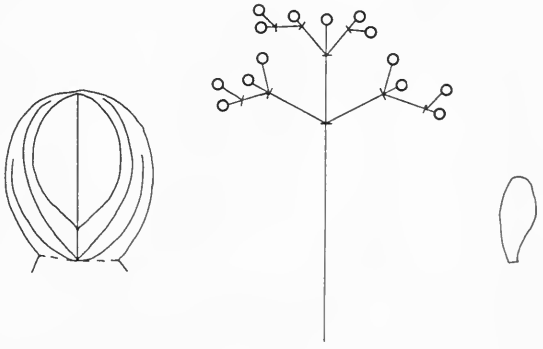
Subshrubs or usually perennial herbs with indumentum to base of inflorescence; leaves all or mostly connate in pairs; bracts and bracteoles glandular-auriculate or not. Species 13–15.

13. **Hypericum coadunatum** Chr. Sm. in Buch, *Phys. Beschr. Canar. Ins.*: 153 (1828); Webb & Berth., *Phytogr. canar.* **1**: 45, t. 4 (1836); Pitard & Proust, *Les Îles Canaries*: 132 (1909); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed., **2**: 180 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 31 (1932), **11**: 163 (1933), **12**: 84 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Lid in *Skr. norske Vidensk.-Acad.* I, Math.-Nat. Kl., N.S. no. 23: 120 (1967); Bramwell, D. & Z., *Wild fls Canary Is*: 68, f. 41 (1974); Kunkel, *Endemismos Canaries*: 292 & map (1977). Type: Canary Islands, *Chr. Smith* s.n. (G?-holotype).

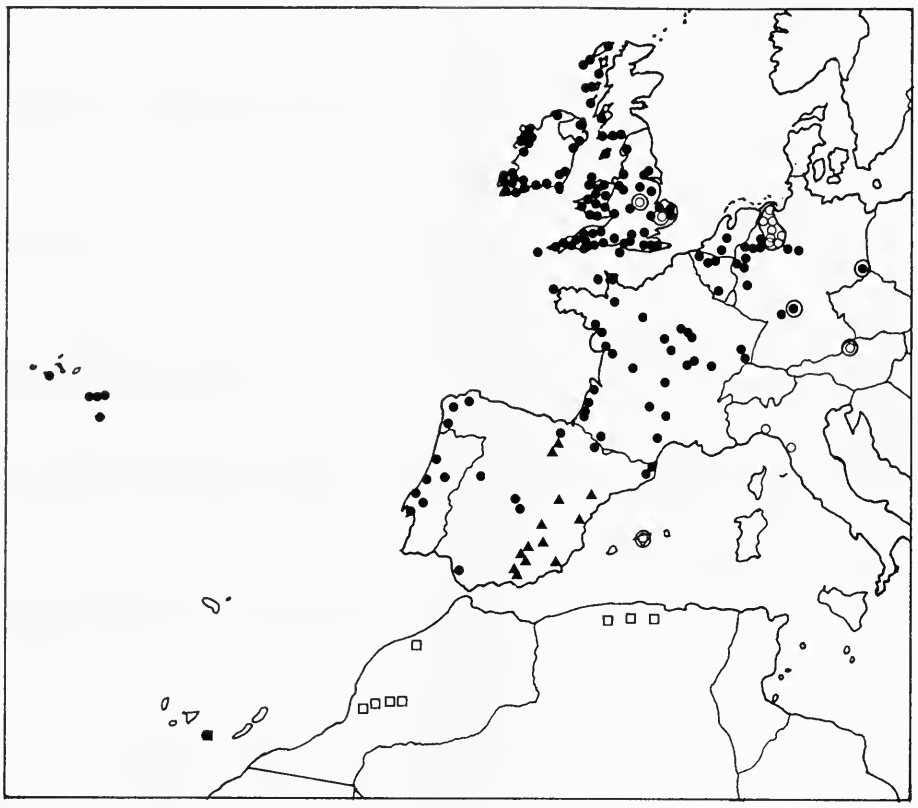
Fig. 27B, Maps 36, 37.

H. coadunatum var. *disjunctum* R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180, nomen.

Icones: Webb & Berth., *Phytogr. canar.* **1**: t. 4 (1836); Bramwell, D. & Z., *Wild fls Canary Is*: f. 41 (1974).



Subshrub or perennial herb with ± woody base, *c.* 0.75–2 m tall, erect to ascending from creeping and rooting base with woody taproot, the branches numerous, forming dense clumps, upper branches spreading-ascending, the whole plant except inflorescence sparsely to rather densely crisped-pubescent. *Stems* green to reddish, 2-lined and ancipitous in inflorescence, otherwise terete; internodes mostly shorter than leaves. *Leaves* sessile, lower pairs free, upper pairs connate; lamina 20–40(–48) × 15–30(–36) mm, broadly elliptic to ovate-suborbicular, concolorous (pale green), herbaceous, not glaucous, plane, spreading; apex rounded, margin



Map 36 Sect. 27: 13. *H. coadunatum* ■ (see also Map 37); 14. *H. naudinianum* □; 15. *H. caprifolium* ▲. Sect. 28. 1. *H. elodes* specimens ●, records ○ (extinct in localities outlined).

plane, base cordate- to subcordate-amplexicaul (lower) or pairs united with rounded sinus between; venation: 3–4 pairs of laterals, curved-ascending from lower *c.* 0.2 of midrib; tertiary reticulation dense, with major areoles bullate above, impressed beneath; laminar glands pale, dense near margin but absent near centre, subequal, sometimes prominent; intramarginal glands black, locally dense but irregular to sparse or almost absent. *Inflorescence c.* 10–60-flowered from 1–2 nodes, densely curved-corymbiform, sometimes with flowering branches from up to 3(?4) nodes, the whole then laxly cylindric to obconic; pedicels 4–6 mm; bracts not auriculate; bracteoles linear-triangular, black-glandular-ciliate or with some marginal glands sessile. *Flowers c.* 15 mm in diam.; buds ellipsoid, obtuse. *Sepals* 3.5–5 × 1.1–1.8 mm, subequal, oblong to lanceolate or elliptic, acute, with margin gland-fringed; veins 5, branched and reticulating towards margin and distally; laminar glands pale, striiform to punctiform and sometimes a few black, subpunctiform; marginal glands black, prominent. *Petals* bright yellow, not tinged red, (6.5–)7–8.5 × *c.* 2–3.25 mm, *c.* 1.6–2 × sepals, narrowly elliptic to narrowly oblong, rounded, without apiculus; laminar glands pale, striiform to punctiform; marginal glands black, 1–*c.* 3, apical, or absent? *Stamens c.* 40, clearly 3-fascicled, longest *c.* 6–7 mm, 0.8–0.85 × petals; anther gland amber. *Ovary* 2.3–2.7 × 1.5 mm, narrowly ovoid-ellipsoid; styles *c.* 4.5 mm, *c.* 1.6 × ovary, spreading-incurved. *Capsule* 4–6 × 3–4 mm, ovoid-subglobose, slightly exceeding sepals, enclosed by petals twisting together. *Seeds* yellow-brown, 0.6 mm long; testa finely scalariform. 2n=18 (Ortega & Navarro, 1978).

Wet rocks in shade or full sun; 500–1500 m.

Canary Islands (Gran Canaria).

CANARY ISLANDS. Gran Canaria: San Bartolome de Tirajana, 1000 m, 3 January 1974 (fr), *Lewalle* 7387 (BM); Cueva del Corcho, 1200 m, 22 July 1972 (fl), *Melville & Bramwell* 72/26 (K); in aquaeductuum stillicidium, 1834? (fl), *Webb* s.n. (K).

Since Maire (1924) wrote that he could find no difference between the Canarian *H. coadunatum* and the North African *H. naudinianum* Coss. & Durieu, except possibly in the distribution of gland-dots, most authors have united these species under the earlier name, *H. coadunatum*. A detailed comparison, however, has revealed several apparently constant differences betwen them. Thus, *H. coadunatum* is more woody in habit with relatively broader bullate leaves, the lower ones being apparently always free (not all pairs connate, as in *H. naudinianum*). It therefore seems desirable to treat them as separate species. They do, however, have the same chromosome number (2n=18), which is also found in their nearest (ancestral) relative, 7. *H. pubescens*.

Kunkel (1977) reports that *H. coadunatum* is in danger where it grows near roads, and that, without protection, it could disappear on account of lack of water. Keller's (1925) record of 'var. *disjunctum*' from Tenerife is apparently without foundation.

14. **Hypericum naudinianum** Coss. & Durieu in *Bull. Soc. bot. France* **2**: 308 (1855); Batt. & Trab., *Fl. Algérie*, Dicots. **1**: 182 (1888); Coss., *Ill. Fl. Atlanticae* **2**: 10, t. 101 ff. 1–13 (1892); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Maire in *Bull. Soc. Hist. nat. Afr. Nord* **22**: 285 (1931). Type: Algeria, prope Blidah ad amnem Oued-el-Kebir, June 1847, *Naudin* (P-holotype).

Fig. 27A, Map 36.

H. perfoliatum Munby in *Bull. Soc. Bot. France* **2**: 283 (1855), non L. (1767).

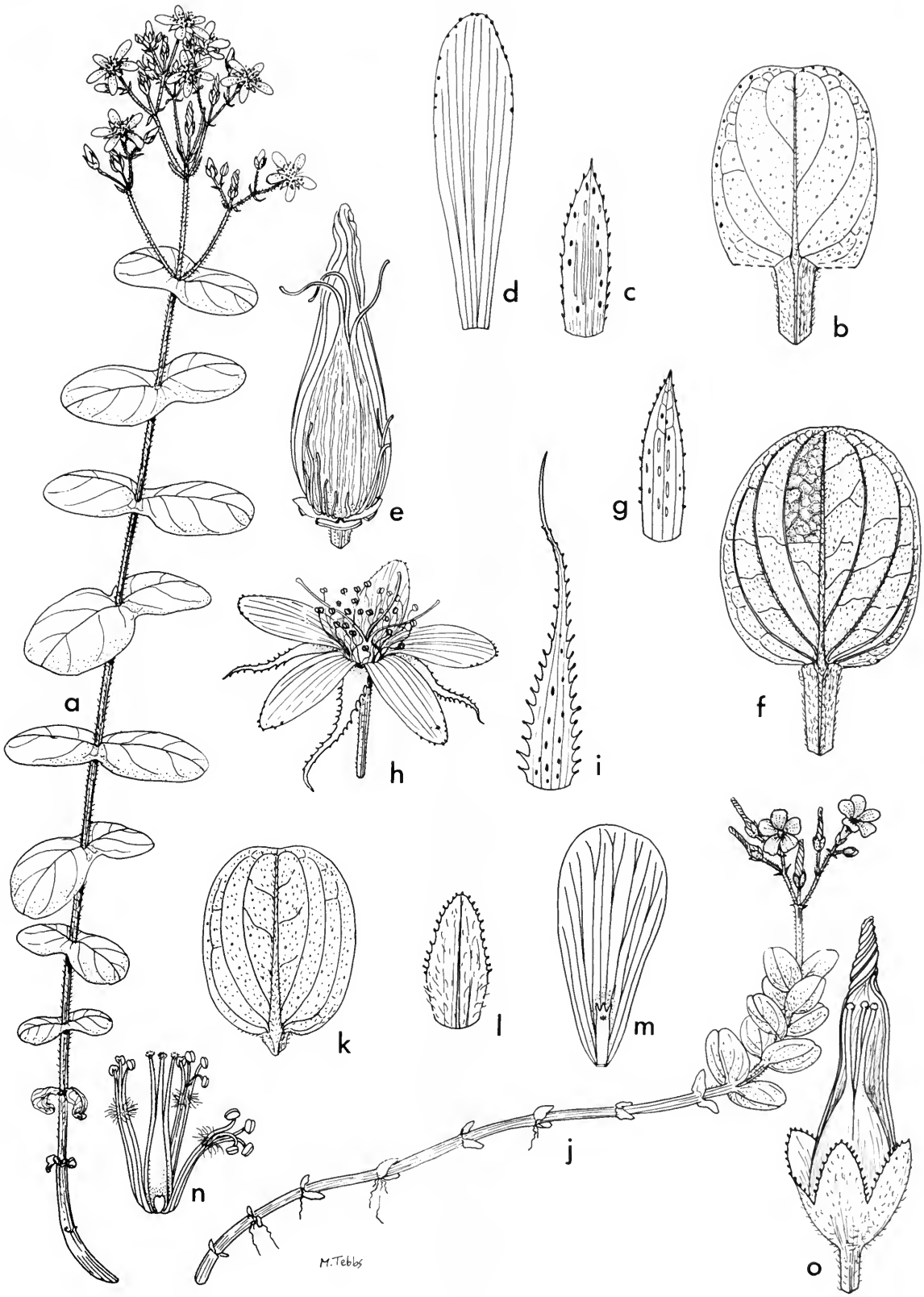


Fig. 27 A. *H. naudinianum*: (a) habit; (b) leaf; (c) sepal; (d) petal; (e) capsule. B. *H. coadunatum*: (f) leaf; (g) sepal. C. *H. caprifolium*: (h) flower; (i) sepal. D. *H. elodes*: (j) habit; (k) leaf; (l) sepal; (m) petal, showing ligule; (n) stamens and ovary, showing one 'lodicule'; (o) flower with developing capsule, two petals removed (a, j × ½; b, f, k × 1; h × 2; c-e, g, i, l-o × 4). A. *Newbould* 186. B. *Lewalle* 7387. C. *Heywood & Davis* 408. D. *Melderis* 87.

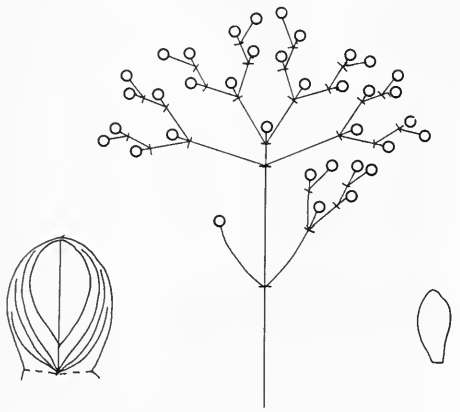
H. atlanticum Coss. in *Bull. Soc. bot. France* **22**: 56 (1875); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); nomen. Type: Cosson cites Morocco, Djebel Ouensa, August 1873 (fl), *Ibrahim* s.n. (K!), but nowhere describes this 'species'.

H. coadunatum var. *atlanticum* Ball in *J. Linn. Soc.* (Bot.) **16**: 374 (1877); Batt. & Trab., *Fl. Algérie*, Dicots. **1**: 183 (1888). Type: Morocco, Grand Atlas, 'in convalle Ait Mesan, versus 1800 m', 13–16 May 1871 (st), *Ball* s.n. (K!-holotype). Ball's query ('var. *atlanticum* nob.?') relates to the Ibrahim collection cited above, of which a specimen was sent to Ball by Cosson labelled '*H. atlanticum* Coss. MSS.'

H. coadunatum sensu Maire in *Mém. Soc. Sci. nat. Maroc* no. 7: 180 (1924); Jahand. & Maire, *Cat. pls Maroc* **2**: 484 (1932); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986) et auct. afr. plur. pro parte omnes excl. typum.

H. caprifolium subsp. *naudinianum* (Coss. & Durieu) Maire in Jahand. & Maire, *Cat. pls Maroc* **2**: 484 (1932); Quézel & Santa, *Nouvelle Fl. Algérie* **2**: 681 (1963).

Icon: Coss., *Ill. Fl. Atlanticae* **2**: t. 101, ff. 10–13 (1892).



Perennial herb (0.3–)0.5–1.5 m tall, erect to ascending from creeping and rooting base, with woody taproot, the basal branches numerous, diffuse, upper branches few, ascending or spreading-ascending or usually absent, the whole plant except inflorescence rather densely crisped-pubescent or (leaves) puberulous. *Stems* green to reddish (below), sometimes 2-lined and ancipitous in upper parts of inflorescence, otherwise terete; internodes mostly exceeding leaves. *Leaves* sessile, all pairs connate; lamina 10–45 × 10–30 mm, ± broadly elliptic to broadly oblong or obovate, subconcolorous, herbaceous, not glaucous, plane, spreading; apex rounded, margin plane, base usually with acute to obtuse or rarely rounded sinus between pairs; venation: 3 pairs of laterals, curved-ascending from lower *c.* 0.3 of midrib; tertiary reticulation dense, plane, not bullate/impressed; laminar glands pale, dense near margin, sparse near centre, not prominent and occasionally a few black, scattered; intramarginal glands black, sparse or absent. *Inflorescence c.* 10–100-flowered from 1–3 nodes, densely curved-corymbiform to rounded-pyramidal, becoming monochasial after second flower, sometimes with flowering branches from up to 4 nodes, the whole then laxly cylindric to obconic; pedicels (2–)3–6 mm; bracts not auriculate; bracteoles linear-triangular, black-glandular-ciliate or with some or all marginal glands sessile. *Flowers c.* 15–17 mm in diam.; buds ellipsoid, obtuse. *Sepals* 3–5 × 1–1.7 mm, subequal to unequal, elliptic to oblong or rarely ovate, acute to subacuminate, with margin gland-fringed; veins 5, branched and reticulating towards margin and distally; laminar glands pale and/or black, striiform to (mostly) punctiform, scattered; marginal glands black, prominent or on very short cilia. *Petals* 'clear butter yellow', tinged or veined red, 8–9(–10) × *c.* 2–2.5 mm, narrowly oblanceolate, rounded, without apiculus; laminar glands pale, punctiform to shortly linear, very sparse or absent, and occasionally black, few, distal; marginal glands black, few or in short dense row, distal. *Stamens c.* 35–40, clearly 3-fascicled, longest (6–)7–8 mm, *c.* 0.8 × petals; anther gland amber. *Ovary c.* 2.5 × 1.8 mm, narrowly ovoid; styles 3, 4.5–5 mm long, *c.* 2 × ovary, widely spreading-incurved. *Capsule* 4.5–6 × 2.5–4 mm, ovoid-pyramidal to ovoid, 1.3–2 × sepals, enclosed by petals twisting together. *Seeds* yellow-brown, 0.4–0.5 mm long; testa finely scalariform. 2n = 18 (Jones in Robson, 1981, as *H. coadunatum*), n = 9 (Galland, 1988, as *H. coadunatum*).

Wet rocks, wet shady banks, streamsides, waterfalls; 90–2230 m.

Morocco (Grand Atlas to Rabat Rif), Algeria (north central).

MOROCCO. Nord-ouest: Forêt de la Mamora, between Sidi Allal-Bahraoui and Kenitra, 150 m, 12 April 1971 (st), *Davis* 54395 (BM, E). Grand Atlas: Asni, Imlil, 1600 m, 18 September 1981 (fl & fr), *Lewalle* 10037 (BM, BR*); 83 km from Ouazagate, 120 km from Marrakech, along P31 *c.* 9 km S. of Tizi-n-Tickka, 2150 m, 10 July 1987 (fl), *Jury, Rejdali & Watson* 9223 (BM, RNG). Rif: prope Adeldal, Beni Selman, ad 1260 m, 12 July 1930 (fl), *Font Quer* 426 (BM). Plaine de Sous: S. of Tizi-n-Test, 10 September 1964 (fl & fr), *R. & A. Harley* 464 (BM).

ALGERIA. Alger: Belida [Blida], ad rupes madidas secus torrentum Oued-el-Kebir, 2 July 1864 (fl), *Paris* 37 (BM); Gorge de la Chiffa, 18 July 1854 (fl), *Cosson* s.n. (K). Kabylie: recorded from Djurdjura Mts by Quézel & Santa (1963: 681).

Although very similar to 13. *H. coadunatum* (q.v.), *H. naudinianum* has apparently constant morphological differences as well as its distinct geographical distribution that favour its recognition as a species. It is even closer morphologically than is *H. coadunatum* to the Spanish 15. *H. caprifolium* (q.v.), which differs essentially from it only in the characters of the calyx.

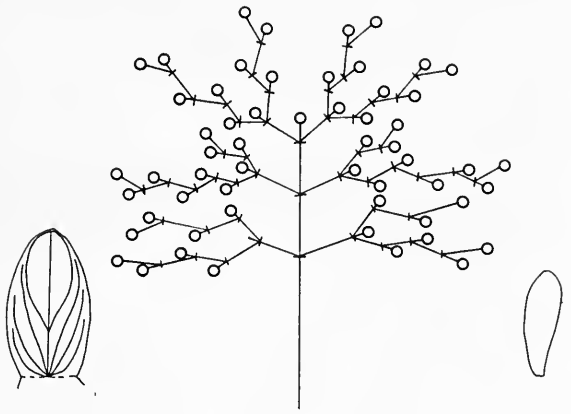
15. **Hypericum caprifolium** Boiss., *Elench. pl. nov.*: 26 (1838), *Voy. bot. Espagne* **1**: t. 35, **2**: 115 (1839); Walp., *Repert. bot. syst.* **1**: 383 (1840); Coss., *Notes pl. crit.*: 99 (1851); Amo, *Fl. Iber.* **6**: 32 (1878); Willk. & Lange, *Prodr. fl. hispan.* **3**: 591 (1878); Coss., *Ill. Fl. Atlanticae* **2**: t. 101 ff. 14–17 (1892); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 180 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 30 (1932), **11**: 163 (1933), **12**: 84 (1934), in *Pflanzenareale* **4**(1): Karte 4a (193); Ramos in *Trab. Dep. Bot. Univ. Complut* **12**: 54 (1983); Burdet, Charpin & Jacquemoud in *Candollea* **39**: 788 (1984); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986); Ramos in *Acta bot. Malacit.* **11**: 169, f. 9d (1986); Motero-Mesa & Pérez-Raya, *Fl. Sierra Nevada*: 183 (1987); Ramos in Castroviejo et al., *Fl. iberica* **3**: 182, t. 52 (1993). Type: Spain, Granada, Sierra Nevada ('Sa. Nevada valles'), July 1837, *Boissier* s.n. (G-lectotype, A. Ramos, 1980); loc. cit. ('In montis humidis regni granatensis praecipue in parte inferiore Sierra Nevada'), 600–1200 m, 1837, *Reuter* s.n. (G-syntype).

Fig. 27C, Map 36.

H. hirsutum Asso, *Syn. Stirp. Arag.*: 107 (1779), non L. (1753).

Icones: Boiss., *Voy. Bot. Espagne* **1**: t. 35 (1839); Coss., *Ill. Fl. Atlanticae* **2**: t. 101 ff. 14–17 (1892).

Perennial herb 0.2–1 m tall, erect or ascending from creeping and rooting base, with ± woody taproot, basal branches few, diffuse, upper branches few, curved-ascending, or usually absent, rarely branched all down stem, the whole plant except inflorescence ± densely crisped-pubescent or (some leaves) puberulous. *Stems* reddish, wholly terete or sometimes (2)4(6)-lined in upper parts of



inflorescence; internodes mostly exceeding leaves. *Leaves* sessile, all pairs except lowermost ones connate; lamina (15–)20–50 × (9–)12–24 mm, elliptic to oblong or ovate-oblong, subconcolorous, not glaucous, plane, spreading; apex rounded to obtuse, margin plane, base with sinus between pairs acute to obtuse or (in lowermost) cuneate; venation: 3 pairs of lateral curved-ascending from lower 0.25–0.5 of midrib; tertiary reticulation dense, plane not bullate/impressed; laminar glands pale, fairly dense, scattered, small, not prominent and sometimes black, sparse, scattered; intramarginal glands black, rather dense, irregular. *Inflorescence c.* 10–80-flowered from 1–4 nodes, densely curved-corymbiform to rounded-pyramidal, becoming monochasial after first flower, sometimes with flowering branches from up to 4 nodes, the whole then laxly cylindric; pedicels 3–5 mm; bracts and bracteoles linear-triangular, apex aristate, black-glandular-fimbriate, at least bracteoles with gland-fringed auricles. *Flowers c.* 12–15(?–20) mm in diam.; buds cylindric, subacute. *Sepals* 5–7 × 0.7–1.7 mm, subequal, narrowly lanceolate, aristate, with margin glandular-ciliate and arista gland-tipped; veins 5, branched and reticulating towards margin and distally; laminar glands pale, punctiform and (mostly) black, shortly linear to punctiform, often dense; marginal glands black, on short to long cilia. *Petals* bright? yellow, tinged or veined red, 8–11 × 3–4 mm, *c.* 1.6 × sepals, oblong-lanceolate to oblanceolate, rounded, without apiculus; laminar glands pale, punctiform to shortly striiform, distal; marginal glands black, in dense row, distal. *Stamens* (25?–)35–45, clearly 3-fascicled, longest 7–9 mm, *c.* 0.9 × petals; anther gland black. *Ovary* 3-locular, *c.* 2 × 1 mm, narrowly ovoid; styles 3, (3.5–)4–5 mm, 1.5–2.5 × ovary, spreading-incurved or spreading. *Capsule* 3.5–4 × *c.* 2.5 mm, ovoid, 0.6–0.75 × sepals, enclosed by petals twisting together. *Seeds* yellow-brown, *c.* 0.6 mm long; testa very finely scalariform (almost smooth). 2n=18 (Reynaud, 1986), 16 (Löve & Kjellqvist, 1974); n=9 (Reynaud, 1986).

Streamsides, flushes and shaded places; 200–2000 m.

Spain (south-east: Andalucía, Murcia, Valencia, Castilla Nueva, Aragón).

SPAIN. Granada: Sierra Nevada, Río Jenil, 20 July 1851 (fl), *Bourgeau* 1097 (K); Darro, 19 July 1883 (fl), *Nilsson* 1519 (BM). Jaén: Sierra de Cazorla, Cueva del Peurco, 1070 m, 6 July 1951 (fl), *Heywood* 1040 (BM, RNG). Murcia: Sierra Carrascoy, December 1855 (fl), *Guirao* in *Bourgeau* s.n. (BM). Albacete: Sierra de Alcaraz, 2 km before turning to Ríopar on C415 from Alcaraz, *c.* 1100 m, 7 August 1982 (fl), *Goyder & Jury* 338 (BM, RNG); prope Alcaraz et Segura, 1000–2000 m, July 1890 (fl), *Porta & Rigo* II 400 (K). Valencia: *fide* Ramos (1993: 182). Castellón: Sierra de Segorbe, 351 m, August 1891 (fl), *Reverchon* s.n. (BM, FR). Cuenca: Solán, orillas del Río Cuervo, 14 August 1942 (fr), *Cabalhro* s.n. (K, MA*). Teruel: prope Castelserás ad ripas aquosas fluminis Guadalupe, 30 July & 1 September 1975 (fl), *Loscos* Cent. I, 25 (FR). Burgos: Miranda de Ebro, orillas del Río Ebro, August 1929 (fl), *Losa* in *Duffour* 5855 (BM).

H. caprifolium is easily distinguished from the North African 14. *H. naudinianum* by the aristate sepals. From the scanty available evidence, the chromosome number is smaller (2n=16, not 18).

Subsect. 4. **Adenosepalum** (see p. 90). Type: *H. montanum* L.

Shrubs or perennial herbs with indumentum to base of inflorescence, or rarely stem or leaves or whole plant glabrous; leaves free; bracts and bracteoles usually glandular-auriculate. Spp. 16–24.

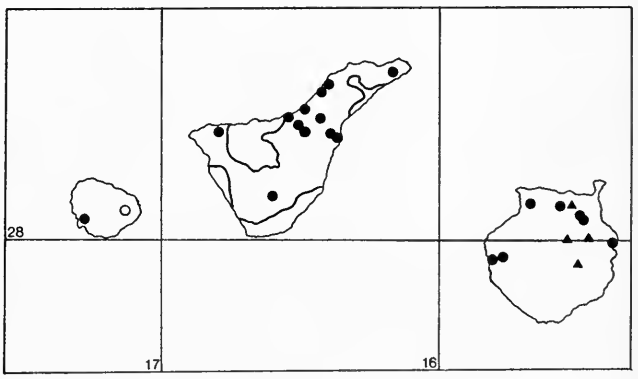
16. **Hypericum reflexum** L.f., *Suppl. pl.*: 346 (1781); Aiton, *Hort. kew.* **3**: 106 (1789), 2nd ed. **4**: 179 (1812); Lam., *Encycl.* **4**: 162 (1797); Willd., *Sp. pl.* **3**: 1458 (1802); Buch in *Abh. K. Wiss. Berlin* **1816–1817**: 362, 371, 380 (1817); Choisy, *Prodr. monogr. Hypéric.*: 53 (1821), in DC., *Prodr.* **1**: 551 (1824); Rchb., *Iconogr. bot. exot.* **1**: 60, t. 86 (1827); Buch, *Phys. Beschr. Canar. Ins.* 153 (1828); Webb & Berth., *Phytogr. canar.* **1**: 44 (1836); Spach in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836); Masferrer in *An. Soc. esp. Hist. nat.* **9**: 27 (1880); Bornm. in *Bot. Jahrb.* **33**: 453 (1903); Pitard & Proust, *Les Îles Canaries*: 133 (1909); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd. ed. **21**: 179 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 1 f. 5 (1932), **11**: 149 (1933), **12**: 83 (1934), in *Pflanzenareale* **4**(1): Karte 2b (1933); Ceballos & Ortuño, *Veg. Fl. for. Canar. occid.*: 387 (1951); Bramwell, D. & Z., *Wild fls Canary Is*: 70, f. 44 (1974); Kunkel, *Endemismos Canarios*: 296 (1977); Kunkel, G. & M.A., *Fl. Gran Canaria* **4**: 44, t. 165 (1979); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72 (1995). Type: Canary Islands, no loc., 1778 (fl), *Masson* s.n. (BM!-holotype). The younger Linnaeus's 'Habitat in Barrancas Americae' must be regarded as a *lapsus calami.*

Fig. 28B, Map 37.

H. foliosum sensu Brouss. ex Webb & Berth., *Phytogr. canar.* **1**: 45 (1836) in synon.

H. reflexum var. *leiocladum* Bornm. in *Bot. Jb.* **33**: 453 (1903) ['*leioclada*']; Pitard & Proust, *Les Îles Canaries*: 133 (1908); Lid in *Skr. norske Vidensk.-Akad.* I, Math.-Nat. Kl., N.S. no. 23: 122 (1967). Types: Canary Islands, Gran Canaria, Tafira, Beo Guiniguada, *c.* 400 m, n.d., *Bornmüller* 2153 (JE-syntype); Gran Canaria, Caldera de Bandama, 17 May 1900, *Bornmüller* 352 (JE-syntype).

H. reflexum var. *myrtillifolium* Bornm. in *Bot. Jb.* **33**: 453 (1903) ['*myrtillifolia*']; Pitard & Proust, *Les Îles Canaries*: 133 (1908)

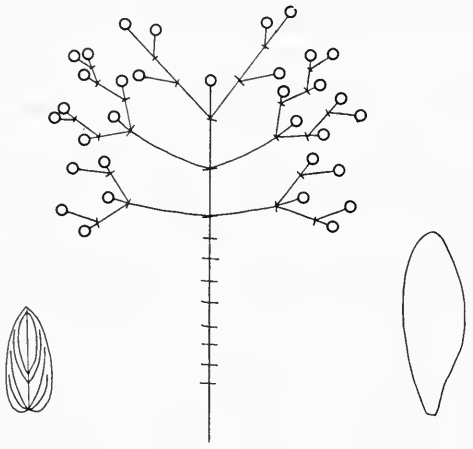


Map 37 Sect. 27: 13. *H. coadunatum* ▲ (see also Map 36); 16. *H. reflexum* (limits on Tenerife according to Voggenreiter, 1974) specimens ●, record ○.

['*myrtifolia*']. Type: Canary Islands, Teneriffe, ad mare prope Taganana, n.d., *Bornmüller* s.n. (JE-holotype).

H. reflexum var. *lanuginosum* Pitard in Pitard & Proust, *Les Îles Canaries*: 133 (1908) ['*lanuginosa*'], in Fedde, *Repert. Spec. Nov.* **9**: 210 (1911); Lid in *Skr. norske Vidensk.-Akad.* I, Math.-Nat. Kl., N.S. no. 23: 122, f. 9b (1967). Type: Canary Islands, 6 specimens cited; Tenerife, Guimar Barranco de Badajoz, 400 m, n.d., *Pitard* s.n. (TUB-lectotype, selected here).

Icones: Rchb., *Iconogr. bot. exot.* **1**: t. 86 (1827); Bramwell, D. & Z., *Wild fls Canary Is*: f. 44 (1974); Kunkel, G. & M.A., *Fl. Gran Canaria* **4**: t. 165 (1979).



Shrub 0.5–1 m tall, densely and divaricately branched below, ± bushy, with branches erect to ascending, the whole plant (usually except stems) glabrous. *Stems* red-brown, compressed (sometimes shallowly 2-lined) and densely villous-tomentose or rarely sparsely puberulous to glabrous when young, soon terete, eventually glabrous; internodes shorter than leaves; cortex exfoliating in usually internodal sheets; bark dark red-brown, smooth. *Leaves* sessile; lamina 10–25 × 3–12 mm, narrowly elliptic or narrowly oblong to ± broadly triangular-lanceolate, concolorous or slightly paler beneath, chartaceous, not or slightly glaucous, glabrous, plane, spreading or somewhat deflexed; apex acute to subacute, margin entire, base cordate to rarely rounded and ± deeply amplexicaul; venation: 2(3) pairs of laterals curved-ascending from lower 0.25(–0.35) of midrib, tertiary reticulation dense and manifest but not prominent; laminar glands pale, dense to rather sparse, unequal, ± prominent; intramarginal glands all black or a few pale, dense but sometimes irregular. *Inflorescence* *c.* 5–40-flowered from up to 3 nodes, without flowering branches from lower nodes, curved corymbiform and dense or rarely lax and rounded-pyramidal; pedicels 2.5–4 mm; bracteoles (and bracts at uppermost 2–3 nodes) narrowly triangular-lanceolate to linear, with rather sparse black-glandular cilia. *Flowers* *c.* 15–20 mm in diam.; buds narrowly ellipsoid, acute. *Sepals* 3.5–6 × 1–2 mm, subequal, free or to *c.* 0.15 united, lanceolate to narrowly oblong, acute to subacuminate, with sessile marginal glands or margin glandular-ciliate; veins 3, laterals branching; laminar glands pale, striiform to usually punctiform; marginal and inframarginal glands black, round- or flat-topped, immersed to sessile or on short (rarely long) cilia. *Petals* rather pale bright yellow, not tinged red, 10–12(–14) × 4–5 mm, *c.* 2.5 × sepals, oblong-oblanceolate, obliquely truncate to rounded, apiculus obsolete or absent; laminar glands pale, few, linear (rarely) or striiform to punctiform; marginal and inframarginal glands all black or some pale, not prominent. *Stamens* *c.* 25, longest 9–10 mm, *c.* 0.8–0.9 × petals; anther gland amber. *Ovary* 2–2.5 × 1–1.5 mm, narrowly ovoid; styles 6–7 mm, *c.* 3 × ovary, widely spreading-incurved. *Capsule* 4–5 × 2.5–3.5 mm, ovoid-ellipsoid, shorter than or equalling sepals, enclosed by petals twisting together. *Seeds* yellow-brown, *c.* 0.6 mm long; testa shallowly linear-foveolate. 2n=18 (Larsen, 1962; Borgen, 1969; van Loon & de Jong, 1978, as var. *lanuginosum*; Reynaud, 1986).

Damp cliffs and walls, around springs and along rocky streams in open localities; 150–1600 m.

Canary Islands (all western islands, i.e. not Fuerteventura or Lanzarote).

CANARY ISLANDS. Tenerife: in rupibus convallis Bufodero, 16 April 1855 (fl), *Bourgeau* 1239 (K); in vicinitate pagum Santa Ursula, Barranco de la Crux, *c.* 200 m, 18 July 1933 (fl), *Asplund* 855 (BM, K); Monte Verde, *c.* 20 km along Orotava – Canada road, 1300 m, 29 August 1971 (fl), *Chicken* 81 (BM). Gomera: Barranco de la Laja, 28 May 1894 (fl), *Murray* s.n. (K); near Benchijiqua, 600 m, 9 May 1977 (fl), *Jarvis* 638 (BM). La Palma: no specimens of *H. reflexum* s.s. seen, only two of *H.* × *joerstadii* (q.v.). Gran Canaria: prope Tafira, 400–500 m, 16 May 1900 (fl & e. fr), *Bornmüller* 351 (H); Risco Blanco de Tirajana, 14 May 1975 (fl), *Bramwell & Humphries* JC240 (BM); Valle de Agache, SW side, 1000 m, 1 August 1960 (fl), *Andrews* R40 (K).

H. reflexum is apparently not closely related to 1. *H. glandulosum*, although the occurrence of intermediates (1x. *H.* × *joerstadii*) suggests that they hybridize. The nature of these intermediates might be revealed by cytological investigation, as the species can have different chromosome numbers, viz. *H. glandulosum* 2n=40, 18, *H. reflexum* 2n=18.

H. reflexum is variable, but there are no breaks in variation such as would warrant the recognition of plants with glabrous stems (var. *leiocladum* Bornm.)[12] or short, ovate or ovate-elliptic leaves (var. *myrtillifolium* Bornm.) as distinct taxa.

H. reflexum is the basic species to which the *H. montanum* group (Spp. 17–24) is related. The chromosome numbers so far recorded for species in this group are all 2n=16 or 32.

17. **Hypericum montanum** L., *Fl. Suec.* 2nd ed.: 266 (1755), *Sp. pl.* 2nd ed.: 1105 (1762); Oeder, *Fl. Danica* **1**: t. 173 (1764); Smith, *Engl. Bot.*: t. 371 (1797?); Ucria, *Hort. reg. panorm.*: 326 (1809); Choisy, *Prodr. monogr. Hypéric.*: 54 (1821), in DC., *Prodr.* **1**: 551 (1824); Spach, *Hist. nat. vég.* Phan. **5**: 392 (1836), in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836); Rchb., *Ic. fl. germ. helv.* **6**: t. 347 f. 5187 (1844); Syme, *Engl. Bot.* 3rd ed.: 158, t. 275 (1863); Boiss., *Fl. orient.* **1**: 807 (1867); Willk. & Lange, *Prodr. fl. hispan.* **3**: 593 (1878); Batt. & Trab., *Fl. Algérie*, Dicots. **1**: 182 (1888); Maire in *Mém. Soc. Sci. nat. Maroc*, no. 7 (1924); Hayek, *Prodr. fl. pen. balc.* **1**: 539 (1925); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 119 (1925); Hegi, *Ill. Fl. Mittel.-Europa* **5**(1): 524, t. 183 f. 3, ff. 2009, 2010 (1925); Jahand. & Maire, *Cat. Pls Maroc* **2**: 482 (1932); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 36 (1932), **11**: 165 (1933), **12**: 85 (1934); Gorshk. in Shishkin & Bobrov, *Fl. U.R.S.S.* **15**: 245 (1949); Guinea, *Viscaya Paisaje veg.*: 219 & map (1949); Ross-Craig, *Drawings Br. Pls* **6**: t. 15 (1952); Grossh., *Fl. Kavk.* 2nd ed. **6**: 174, Karta 192 (1962); N. Robson in Davis, *Fl. Turkey* **2**: 385 (1967), in Tutin et al., *Fl. europaea* **2**: 265 (1968); Hultén, *Atlas växt. utbred. Norden*: 317, map 1231 (1971); Kask in *Eesti N.S.V. Floora* **8**: 28, ff. 6–8 (1971); Franco, *Nova Fl. Portugal* **1**: 450 (1971); Stjep.-Vesel. in Josifović, *Fl. Srbije* **3**: 112, t. 32 f. 3 (1972); Fournier, *Quatre flores France* 2nd ed.: 455 (1977, repr. 1990); Meusel, *Vergl. Chor. Zentraleur. Fl.* Texte **2**: 23, Karten **2**: 284 (1978); Mennema,

[12] But see p. 175.

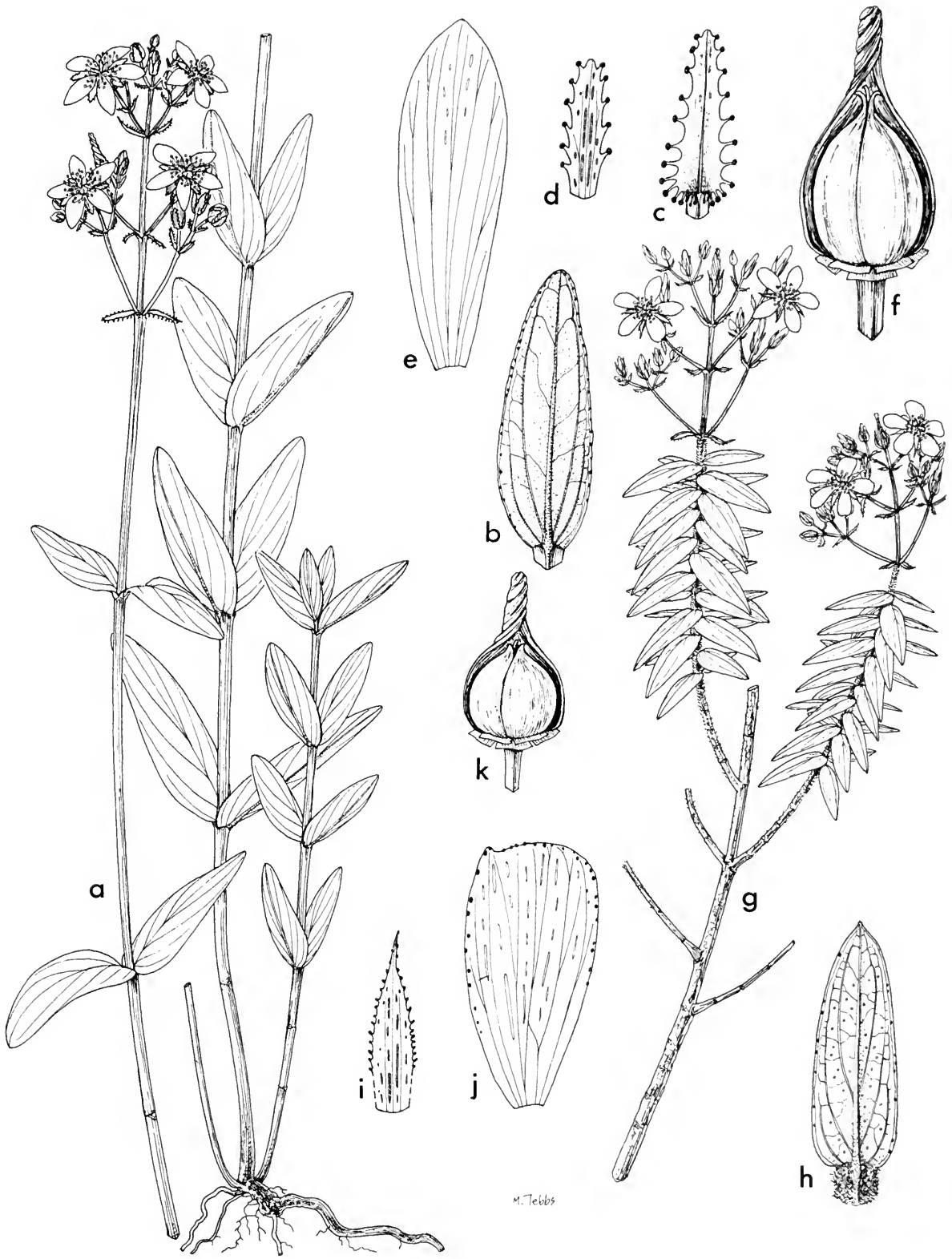


Fig. 28 A. *H. montanum*: (a) habit; (b) leaf (lower surface) and part of stem; (c) bract; (d) sepal; (e) petal; (f) capsule. B. *H. reflexum*: (g) habit; (h) leaf (lower surface) and part of stem; (i) sepal; (j) petal; (k) capsule (a, b, g × ½; h × 2; c-f, i-k × 3). A. *Font Quer* Iter maroc. 1928 268, *Lacaita* 6392. B. *Bourgeau* 80, *Asplund* 855.

Quené-Brot. & Plate, *Atlas Netherl. Fl.* **1**: 132 (1980); Pignatti, *Fl. Italia* **1**: 346 (1982); I. Hagemann in *Flora* **173**: 117, ff. 19, 39 (1983); Ramos in *Trab. Dep. Bot. Univ. Complut.* **12**: 54 (1983), in *Acta bot. Malacit.* **11**: 169, f. 9c (1986); N. Robson in *Wild Fl. Mag.* no. 403: 17 (1985); Lid, *Norsk-Svensk-Finsk Fl.*: 316, 741 (1985); Greuter, Burdet & Long, *Med-Checklist* **3**: 269 (1986); Clapham, Tutin & Moore, *Fl. Br. Isles* 3rd ed.: 116 (1987); Haeupler & Schonf., *Atlas Farn.-u. Blütenpfl. Bundesrep. Deutschl.*: 330, Karte 92 (1988); Perring & Walters, *Atlas Br. Fl.*, repr. amend.: 59 (1990); Stace, *New Fl. Br. Isles*: 256 (1991); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72 (1995). Type: Sweden, Skåne?, 'in montibus Westrogothiae 213. Scaniae', *Herb. Linn.* 943.39 (LINN!-lectotype, selected here; SBT[labelled by Linnaeus, *fide* Jarvis]-syntype). Although Linnaeus's protologue includes references to Bauhin's *Pinax* and *Historia*, Columna's *Ekphrasis* and Fuch's *Historia*, the absence of this plant from the first edition of *Species plantarum* (1753) suggests that either Linnaeus had not seen material of it by that date or (more likely) that he had overlooked it. From the relatively full treatment of *H. montanum* in both *Fl. suecica* 2nd ed. and *Species plantarum* 2nd ed., however, it would seem that by 1755 he had obtained such material. The only specimen of this species in the Linnaean Herbarium (LINN) is unannotated, apart from the name; but there seems little doubt that it is one of the specimens mentioned in *Fl. suecica*. It is therefore the most appropriate lectotype.

Fig. 28A, Map 38.

H. elegantissimum Cr., *Stirp. austr.* **2**: 63 (1763). Type: Austria, 'In Gatterhölzel, Dornbach & alibi non infrequens', *Crantz* (BP!-holotype).

H. glandulosum Gilib., *Fl. Lituan.* **2**: 205 (1782), nom. illegit. superfl. (based on *H. montanum* L.).

H. confertum Moench, *Meth. bot.*: 129 (1794), nom. illegit. superfl. (based on *H. montanum* L.).

H. montanum [var.] β *triphyllum* Choisy, *Prodr. monogr. Hypéric.*: 54 (1821), in DC., *Prodr.* **1**: 552 (1824). Type: France, Fontainebleau, *Anon.* (G-DC!-holotype).

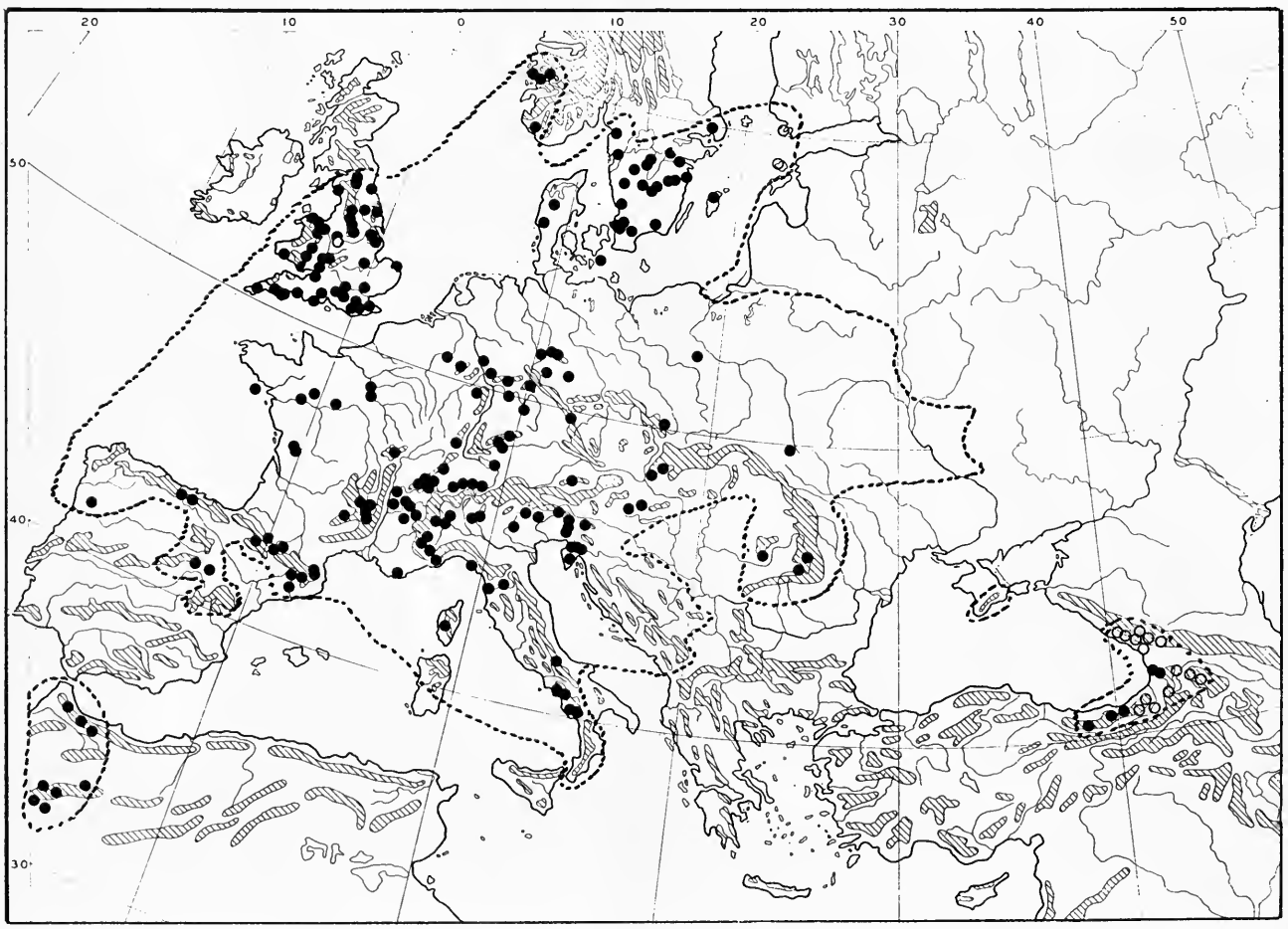
H. montanum [var.] β *scabrum* Koch, *Syn. fl. germ. helv.* **1**: 135 (1835); Hayek, *Prodr. fl. pen. Balc.* **1**: 539 (1925); Hegi, *Ill. Fl. Mittel-Europa* **5**(1): 525 (1925); Maire in *Bull. Soc. Hist. nat. Afr. Nord* **27**: 216 (1936) et auct. plur. Type not stated.

H. montanum [var.] β sensu Ledeb., *Fl. rossica* **1**: 450 (1842) = var. *caucasicum* Boiss. (see below).

H. tauricum sensu hort. ex Ledeb., *Fl. rossica* **1**: 450 (1842) in synon.

H. montanum [var.] β *caucasicum* Boiss., *Fl. orient.* **1**: 807 (1867); Parl., *Fl. ital.* **5**: 532 (1875); Woronow in Kuzn., Busch & Fomin, *Fl. Cauc. crit.* III, **9**: 46 (1906); Hegi, *Ill. Fl. Mittel-Europa* **5**(1): 526 (1925) ['var. *caucasicum* Parl.']; Grossh., *Fl. Kavk.* **3**: 70 (1932), 2nd ed. **6**: 174 (1962). Types: Turkey, Trabzon, vallée d'Of (Lazistan), vers 200 m, 27 June 1866 (fl & fr), *Balansa* 86 (G!-lectotype; E!-photograph); Georgia, Guria, n.d. (fl), *Szowits* s.n. (LE-syntype; G!, E!-photograph).

Adenosepalum montanum (L.) Fourr. in *Ann. Soc. Linn. Lyon* N.S., **16**: 353 (1868).



Map 38 Sect. 27: 17. *H. montanum* specimens ●, records ○; limits according to literature.

Hypericum montanum forma *humifusoides* Kuntze in *Flora* **1880**: 305 (1880). Type: Germany, Saxony, Spitzberg bei Wurzen, 1879, *Kuntze* (NY-holotype).

H. montanum [var.] α *typicum* G. Beck, *Fl. Nieder-Österr.*: 531 (1892); Hegi, *Ill. Fl. Mittel-Europa* **5**(1): 525 (1925). Type as for *H. montanum* L.

H. montanum var. *scaberulum* G. Beck, *Fl. Nieder-Österr.*: 531 (1892), nom. illegit. superfl. (based on *H. montanum* var. *scabrum* Koch).

H. ciliatum var. *pseudociliatum* R. Keller in Albov, *Prodr. fl. colchic.*: 42 (1895). Type: Georgia, Guria, jugum Adzharo-Imereticum, 1893, *Ardasenov* s.n. (G?-holotype).

H. montanum forma *ternatum* Borbás, *A Balaton Tudom. Tunul. Ered.* **2**. Szakasz: 403 (1900). Type not indicated.

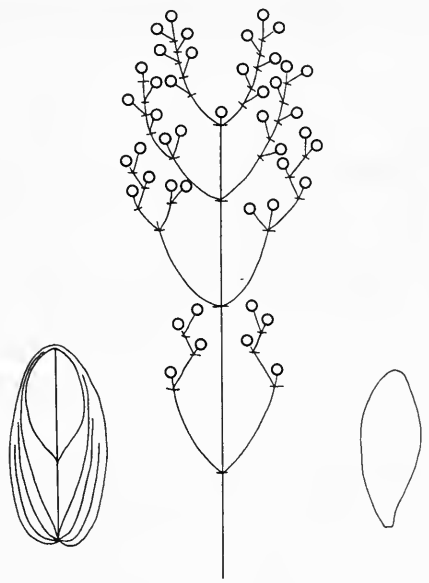
H. perfoliatum var. *pseudociliatum* (R. Keller) Woronow in Kuzn., Busch & Fomin, *Fl. Cauc. crit.* III, **9**: 49 (1906).

H. montanum forma *abbreviatum* Reinecke in *Mitt. Thür. Bot. Ver.* **30**: 19 (1913), in *Jb. K. Akad. gem. Wiss. Erfurt* **40**: 150 (1914). Type: Germany, Thüringen, Erfurt, Möbisburger Holze südlich von Rhoda, *Reinecke* (JE?-holotype).

H. montanum subsp.? *elegantissimum* (Cr.) G. Jav., *Mag. Fl.* **2**: 720 (1925).

H. montanum forma *subprolificum* Murr (1928), *fide* Sóo (1968).

Icones: Syme, *Engl. Bot.* 3rd ed.: t. 275 (1863); Ross-Craig, *Drawings Br. Pls* **6**: t. 15 (1952).



Perennial herb 0.2–0.8 m tall, wholly erect or decumbent to ascending but not rooting at base, with woody taproot, few-stemmed, usually unbranched below inflorescence, wholly glabrous often except leaves beneath. *Stems* green to reddish, terete; internodes all or upper exceeding leaves. *Leaves* sessile; lamina (20–)25–70 × (10–)13–28 mm, oblong-elliptic to lanceolate or ± broadly ovate, paler beneath, thinly chartaceous, not glaucous, wholly glabrous or usually scabrid to puberulous beneath, plane, spreading; apex obtuse to rounded or uppermost subacute, margin entire, base rounded to truncate or subcordate; venation: 3–4 pairs of laterals curved-ascending from lower 0.2–0.25 of midrib; tertiary reticulation dense, not or slightly prominent; laminar glands pale, dense, unequal, not prominent, rarely absent ('var. *caucasicum*'); intramarginal glands black, dense but irregular, the larger often submarginal. *Inflorescence* 7–32(–*c.* 50)-flowered from up to 3(4) nodes, without flowering branches from lower nodes, curved-pyramidal or corymbiform to subcapitate and dense, or lower node(s) ± distant with dense partial inflorescences, the whole then narrowly pyramidal to narrowly cylindric; pedicels 1.5–4 mm; bracts and bracteoles linear, black-glandular-ciliate, densely glandular-auriculate. *Flowers* 10–15(–20) mm in diam.; buds narrowly ellipsoid to cylindric, rounded. *Sepals* 5–6 × 1–1.5 mm, subequal or equal, free or very shortly united, narrowly oblong to narrowly lanceolate, acute, with margin rather long-glandular-ciliate; veins 5, laterals branching; laminar glands pale, linear to striiform; marginal glands black, flat-topped. *Petals* pale yellow, not tinged red, (8–)10–12 × 2–3.5 mm, *c.* 2 × sepals, oblong-lanceolate, rounded, apiculus absent; laminar glands pale, few, elongate-punctiform or usually absent; marginal glands absent. *Stamens* 20–28, longest 6–9 mm, *c.* 0.75 × petals; anther gland black. *Ovary* 2.5–3.5 × 1.5–2.5 mm, narrowly to rather broadly ovoid; styles 3–4 mm, 1.2–1.35 × ovary, spreading. *Capsule* 6–8 × 4–6 mm, ovoid, exceeding sepals, enclosed when developing by petals twisting together. *Seeds* dark red-brown, 0.8 mm long; testa linear-reticulate. 2n=16 (Noack, 1939; Robson, 1956; Reynaud, 1975; Löve & Löve, 1982), n = 8 (Nielsen, 1924; Gagnieu & Wilhelm, 1965).

Woods, thickets and hedgebanks, on calcareous or gravelly soils; lowland (especially in the north) to 1200 m (Italy), 1450 m (Spain) and 1950 m (Morocco).

From northern England, Denmark, southern Norway, and southern Sweden, southern Finland (one locality), Estonia (one locality), Poland, Belarus and the Ukraine (including Krym), south to N. Portugal, central Spain, Corsica, Sardinia, Italy, Bosnia, Serbia and Romania; also Georgia, NE Turkey and Morocco.

GREAT BRITAIN. Devon: Brixham, Berry Head, 19 July 1936 (fl), *Hall* s.n. (BM). Surrey: Addington, Court Wood, 31 July 1924 (fl), *Salmon* s.n. (BM). Oxfordshire: near Caversham, 3 August 1890 (fl), *Wolley Dod* s.n. (BM). Gloucestershire (W.): Tidenham, August 1922 (e. fr), *Redgrove* s.n. (BM). Glamorgan: Bishopston Valley, August 1913 (fr), *Shepherd* s.n. (BM). Pembroke: Tenby, Black Rock, 19 August 1954 (fr), *Townsend* s.n. (K). Caernarvon: Great Orme's Head, 18 July 1912 (fl), *Bickham* s.n. (BM). Yorkshire (NE): Helmsley, 2 August 1952 (fl & fr), *Bangerter* 125 (BM). Westmorland: Anna Well Force, 5 August 1927 (fl), *Foggitt* s.n. (BM).

NORWAY. Hordaland: Bergen, Hardanger, Godoü, 8 August 1982 (fl & fr), *Rettig* s.n. (H). Vest Agder: Randesund Dvergones, 9 August 1959 (e. fr), *Skrimer* s.n. (H).

SWEDEN. Göteborg: Partille, L. Prästtjärn, 30 July 1928 (fl), *Ohlsén* in *Samuelsson Pl. Suec.* 1155 (BM, K). Älvsborg: Njörn, Sundsby, 9 July 1950 (fl), *Häyrén-Malmström* s.n. (H). Jönköping: in montibus Huskvarna, September 1902 (fr), *Bergstrand* s.n. (H). Östergotland: Valdemarsvik, Borg, 5 August 1985 (l. fl), *Nannfeldt* 19047 (BM). Halland: Halmstad, 27 July 1956 (fl), *P. Fries* s.n. (H). Malmöhus: Helsingborg, 26 July 1885 (fl), *Trolander* (H). Gotland: Slite Tildehajdal, 20 July 1968 (fr), *Alanko* (H).

FINLAND. Turku: Abö, Lojo, juxta praed. Luusi, in pago Jantoniensi, 11 August 1915 (fl), *Lindberg* in Pl. Fin. Exsicc. 1241 (K).

ESTONIA. Recorded from Saaremaa I. (Ösel), Harva (Kask, 1971: 30, f. 7).

DENMARK. Jylland: Ribe Varde, 26 August 1896 (fr), *Boldt* s.n. (H); Viborg, Daugbjerg, W. of Viborg (distr. 15), 4 August 1974 (fl), *Knutz* s.n. (H). Sjaelland: Nordsjaelland, Holte, Geelskov, 3 July 1943 (fl), *Dahl* D. 45a (BM). Mön: Freuchens Pynt, 3 July 1935 (fl), *von Wendt* s.n. (H).

GERMANY. Niedersachsen: Hildesheim, July 1867 (fl), *Evers* 507 (H). Nordhein-Westfalen: Bonn, n.d. (fl & fr), *Sievreck* s.n. (H). Rheinland-Pfalz: Donnersberg, 28 July 1905 (fl), *Knabe* s.n. (H). Hessen: Unteres Werragebiet, 29 July 1898 (l. fl), *Goldschmidt* s.n. (FR). Baden-Wurtemberg: Tübingen, 19 July 1922 (fl), *Petterssen* s.n. (H). Bayern: Steinebach am Wörthsee, 1 September 1918 (fr), *Oberneder* 3283 (BM). Thüringen: bei den Dornburger Schlössern, 9 July 1950 (fl), *Launert* s.n. (BM). Sachsen-Anhalt: Alte Stolberg, 8 July 1882 (fl), *Vock* s.n. (K). Mecklenburg: Crivitz, 12 July 1880 (fl), *Neverrmann* s.n. (BM).

HOLLAND. Scattered records in south and south-east (*fide* Mennema, Quené-Broterenbrood & Plate, 1980: 132).

BELGIUM. Namur: Nettine, July 1937 (fl), *Masseray* s.n. (BM). Hainault: Obourg, 4 July 1867 (fl), 22 August 1867 (fr), *Martinis* VI 260 (BM, K).

LUXEMBURG. Several records (*fide* Rompaey & Delvosalle, 1979: map 423).

FRANCE. Seine-et-Oise: Coteau de la Ferté-Alais, 23 July 1876 (fr), *Bonnet* s.n. (K). Loir-et-Cher: Coteau de Lavardin, 1856 (fr), *Vorel* 631 (BM). Maine-et-Loire: Soucelles, 16 July 1874 (l. fl), *Genevier* s.n. (BM). Morbihan: Belle Île vis-à-vis Kerouarh, Pont-en-Dro, 3 July 1901 (fr), *Gadeceau* 631 (BM) -extinct? Deux-Sèvres: forêt de Chizé, 24 July 1910 (fr), *Gadeceau* s.n. (BM). Côte d'Or: Messigny, Combe de Chainoux, 18 July 1869 (fr), *Laguesse* s.n. (K). Haut-Rhin: Habsheim, forêt de la Hardt, 240 m, 20 July 1974 (fr), *Rastetter* in *Exsicc. Auguier F.16* 7616 (BM). Doubs: Bonnevaux, n.d. (l. fl), *Depierre* s.n. (BM). Ain: Miribel, July 1912 (fl), *Reverchon* s.n. (FR). Haute-Savoie: Vacheresse, à la Baume, 30 July (fr), *Depierre* s.n. (BM). Savoie: Mont Grelle près Chambery, 9 August 1896 (fr), *Borel* s.n. (K). Basses-Alpes: Goudeissart près Barcelonnette, 11 August 1884 (fl), *Wilmott* s.n. (K). Var: Mont des Maurs, near Collobrières, 24 June 1914 (fl), *Adamson* s.n. (BM). Isère: Villard-de-Lans, Gorge de la Bourne, 30 September 1949 (fr), *Sandwith* 3529 (K). Rhône: Lyon à Niron, 3 July 1883 (fl), *Jordan* s.n. (BM). Haute-Loire: de Lempdes à Blesle, June 1876 (fl), *Girardet* s.n. (BM). Cantal: environs d'Ydes, Lisière des bois, 18 August 1873 (fr), *A. Braun* s.n. (BM). Aveyron: Viviez, June 1905 (fl), *Garrau* in *Elías* 812 (BM). Pyrenées-Orientales: Vernet, 900 m, 9 July 1934 (e. fr), *Wyatt* 119 (K). Ariège: Ax les Thermes, July 1925? (fl), *Lofthouse* s.n. (BM). Haute-Garonne: Luchon, 14 July 1889 (fl), *Murray* s.n. (BM). Hautes-Pyrenées: zwischen St Sauveur und Sazos, 3 July 1925 (fl), *Ronniger* s.n. (W).

SPAIN. Oviedo: Oviedo, gorge of R. Sella, 13 July 1927 (fr), *Wilmott* s.n. (BM). Santander: Picos de Europa, supra pagum Epinama, *c.* 1000 m, September 1930 (fr), *Buch* s.n. (H). Huesca: Los Arañones (Caufranc), 2 August 1955 (fl & fr), *Sandwith* 4488 (K). Lerida: Val d'Aran, Forêt de Betren, 1200 m, 25 July 1934 (fr), *Estival* in *Sennen* 9056 (BM). Gerona: Sol de Santicosa, 950 m, 8 August 1934 (fr), *Sennen* s.n. (BM). Barcelona: in dumetis Montiserrati, July 1906 (fr), *Marcet* s.n. (BM). Madrid: Kast. Schiedegebirge [Sade Guadarama], Somosierra, 'Hayedo de Montejo', 1350 m, 6 June 1962 (st), *Ern* s.n. (FR).

PORTUGAL. Tras os Montes: Bragança, Monte de San Bartolomeu, 24 June 1955 (fl), *Fernandes, Matos & Matos* 5488 (BM).

CORSICA. Ajaccio to Curti [Corte]: Vivazione, 500–700 m, 3 July 1970 (fl), *Verdcourt* 4781 (K); ? : Premier Cascade de l'Aqua ardente, 13 July 1917 (fl), *Forsyth Major* H292–23 (K).

SARDINIA. No specimens seen, but recorded by e.g. Pignatti (1982).

ITALY. Venezia: Resiutta, slopes of Plauris, 17 July 1863 (l. fl), *Hb. Churchill* s.n. (K). Trentino/Alto Adige: Molveno, 4 August 1926 (fr), *Barton* s.n. (BM). Lombardia: Chiavennas, 9 July 1886 (fr), *Murray* s.n. (BM). Val d'Aosta: Val de Cogne, over Valoutay, 3 August 1864 (fr), *Hort* s.n. (BM). Piedmonte: pratis alpinis Valdensium, July 1860 (fr), *Rostan* s.n. (BM). Liguria: Portofino Peninsula, S. of Genoa, 10 September 1963 (l. fl), *Robson* 1807 (BM). Emilia-Romagna: Modena, Piandelagotti, Boschi, 1150 m, 4 July 1934 (fl), *Lennart* s.n. (H). Toscana: Gugena, 29 June 1964 (fl), *Ranhala* s.n. (H). Abruzzi e Molise: M. Sirente, 1500 m, July 1875 (fl), *Groves* s.n. (K). Campania: Salerno, Monte Mai de Calvanico, *c.* 1200 m, 19 July 1921 (fl), *Lacaita* 240/21 (BM).

SWITZERLAND. Genève: prope Genevam, n.d. (fr), *Herb. Boissier* (K). Vaud: La Comballaz, 10 July 1881 (fl), *Branner* s.n. (H). Valais: Val d'Entremont, Sembranchori, 880 m, 16 July 1980 (fl), *Lawalrée* 22569 (BM). Bern: Meiringen, Starelamm, Finstere Schucht, 4 September 1924 (fl & fr), *Barton* s.n. (BM). Zürich: Sihtwald, 21 July 1923 (fl), *Häyren* s.n. (H). Schwyz: near Brunnen, 27 July 1898 (fl), *L.S. Wright* s.n. (K). Glarus: Klöntal, 21 August 1930 (fl), *Lacaita* 6391 (BM). Ticino: Monte Generoso, 6 July 1856 (fl), *Murray* s.n. (BM).

AUSTRIA. Tirol: Lienz, 20 July 1869 (fl), *Gander* s.n. (BM, K). Steiermark: Graz, Racherkogel, *c.* 500 m, July 1911 (fr), *Fritsch* in *Hayek* Fl. Stir. exsicc. 1201 (BM, H). Niederösterreich: Semmering, Reichenau, August 1924 (fr), *Buch* s.n. (H).

HUNGARY. Several localities (*fide* Soó, 1968: 437).

SLOVENIJA. Postojna, 300 m, 20 July 1960 (e. fr), *McCallum Webster* 4081 (K).

CROATIA. Istra, Abbazia, oberhalb Vrutki-Tal, 25 June 1935 (fl), *Ronniger* s.n. (W).

SERBIA and BOSNIA HERZEGOVINA. Present (*fide* Stepanović-Vesilichić, 1972).

ROMANIA. Transylvania: Arad, p.p. Camna, 8 September 1974 (fr), *Danciu* s.n. (BM); Covasna, prope opp. Sf. Gheorghe, 14 August 1981 (fr), *Danciu* s.n. (BM); Brasov, p.p. Cristian, *c.* 800 m, 1 August 1973 (fr), *Parascan & Danciu* s.n. (BM).

CZECH REPUBLIC. Moravia: M. Weisskirchen, Parsihouster Reviers, August 1912 (fr), *Petrak* Fl. Boh. & Mor. XI 1048 (BM); Brünn [Brno], Runitz, July 1931 (fl), *Hruby* s.n. (K). Also in Bohemia and Slovakia.

POLAND. Poznan: Konen, 16 July 1868 (fr), *Baenitz* s.n. (BM).

BELORUSSYA. Brest, bei Sevcki (?), 20 June 1859 (fl), *Lehmann* s.n. (BM).

UKRAINE. Lesienice k. Lwowa [Lvov], 19 July 1938 (fr), *Madalski* Pl. Pol. Exsicc. 332 (BM, K); Bojarka, 1 July 1903 (fl), 15 July 1903 (fr), *Finn* 169 (H). Krym: Kastali (Vulf, 1953).

GEORGIA. Poti, n.d. (fl & fr), *Nordmann* 308 (H); Guria, n.d. (fl), *Szowitz* (G, E-photograph).

TURKEY. Giresun: 42 km S. of Giresun (N. of Khümbet), 1000 m, 7 July 1969 (fr), *Sorger* 69–24–4 (W). Trabzon: Lazistan, Vallée d'Of, vers 200 m, 27 June 1866 (fl & fr), *Balansa* 86 (G, E-photograph); Sumela Kloster, 800–1300 m, 28 July 1982 (fr), *Sorger & Buchner* 82–91–18 (W). Rize: ? (no specimens seen). Çoruh: Artvin and Ardanuç (Grossheim, 1962: map 192).

MOROCCO. Rif: Mt Buhaschen [Yebel Buhasen], 1300 m, 20 June 1928 (fl), *Font Quer* Iter Maroc. 1928 268 (BM); Ketama, Telata, vers 1450 m, 5 August 1932 (fl), *Sennen & Mauricio* s.n. (BM). Zaïan: Azrou, 12 km from Azrou to Ifrane, 1350 m, 26 June 1974 (fl), *Reading U./B.M. Exped.* 1058 (BM, RD*). Moyen Atlas: Forêt d'Aïn Kahla, 1950 m, 20 July 1924 (fr), *Jahandiez* 832 (BM).

H. montanum is the north-western member of a pair of species that appears to be directly related to 16. *H. reflexum* (from the Canary Islands), the other member being 18. *H. annulatum*. *H. montanum* is mainly west, central and east European and north-west African; *H. annulatum* is mainly south-east European and north-east to east African.

H. montanum can be separated from *H. annulatum* only on a combination of characters, since the latter in particular is very variable. *H. montanum* is always glabrous except on the lower leaf-surface, which is usually scabrid. Where that, too, is glabrous (var. *typicum* G. Beck), the species can nearly always be distinguished from wholly glabrous forms of *H. annulatum* by the condensed inflorescence or partial inflorescences. In most cases, however, *H. annulatum* can be recognized by the presence of hairs on the stem and upper leaf-surface and the relatively lax inflorescence.

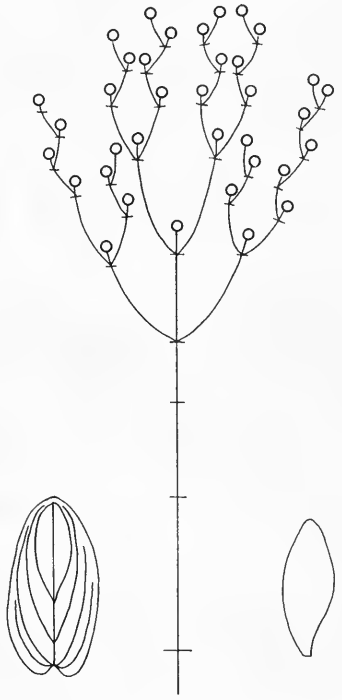
H. montanum is not very variable other than in leaf shape, the indumentum of the lower leaf-surface and the presence or absence of partial inflorescences. The scabrid lower surface of the leaf (var. *scabrum* Koch, var. *scaberulum* G. Beck) is by far the commoner state, although Beck named the wholly glabrous form var. *typicum*. The lectotype, too, is scabrid beneath, and so var. *typicum* is not the type variety, i.e. var. *montanum*. In fact, the glabrous leaf seems to be no more than a shade-induced state that does not merit taxonomic recognition.

In Georgia and Turkey most of the populations have leaves without laminar pale glands (var. *caucasicum* Boiss.); but this character is not wholly constant, and so I have not given these populations taxonomic recognition either.

Finally, *H. montanum* var. *pilosum* Horwood is *H. hirsutum* L., whilst var. *maculantherum* Sagorsky and var. *punctatum* Andreanszky are almost certainly respectively *H. spruneri* Boiss. and *H. perfoliatum* L., although I have not yet managed to see the type of either variety. The record of *H. montanum* from southern Greece (Messinia) (Sibthorp & Smith, *Fl. Graecae Prodr.* **2**: 117, 1813) possibly refers to *H. vesiculosum* Griseb. (sect. 13. *Drosocarpium*), which occurs there.

18. **Hypericum annulatum** Moris, *Stirp. sard. elench.*: 9 (1827); *Fl. Sardoa* **1**: 323, t. 22 (1837); Walp., *Repert. bot. syst.* **1**: 384 (1840); N. Robson in *Kew Bull.* **12**: 444 (1958), in *Fl. Europaea* **2**: 265 (1968); Moggi & Pisacchi in *Webbia* **22**: 272, f. 13 (1967); Arrig. et al. in *Webbia* **28**: 423 & f. 1 (1973); Pignatti, *Fl. Italia* **1**: 46 (1982); Chiappini, *Fl. paesag. veg. Sardegna*: 26, t. 11 (1985); Greuter, Burdet & Long, *Med-Checklist* **3**: 264 (1986); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72, ff. 11.5, 11.15 (1995) (= '*H. degenii*'). Type: Sardinia, in summo S. Vittoria esterzili, July 1826 (fl), *Moris* s.n. (TO-holotype, K!-photograph; FI- isotype).

Fig. 29C (subsp. *afromontanum*).



Perennial herb 0.2–0.75 m tall, wholly erect or shortly decumbent but not rooting at base, with ± woody taproot, usually few-stemmed, unbranched below inflorescence or sometimes with short axillary shoots, wholly glabrous or usually puberulous to densely shortly whitish-pubescent on stems below inflorescence and on both leaf surfaces. *Stems* green to reddish, terete; internodes all shorter than leaves or upper exceeding them, eglandular or sparsely (along 'lines') to densely black-gland-dotted or shortly black-gland-streaked. *Leaves* sessile; lamina (5–)10–55 × (3–)5–32 mm, narrowly oblong or oblong-elliptic or lanceolate or rather broadly ovate, paler beneath, thinly chartaceous, not glaucous, glabrous to ± densely pubescent on both sides, plane, spreading; apex acute to rounded, margin entire, base rounded to truncate or subcordate; venation: (3)4–5 pairs of laterals curved-ascending from lower 0.2–0.5 of midrib, tertiary reticulation dense, not prominent; laminar glands all pale or occasionally some black, dense, unequal; intramarginal glands black, dense but irregular to rather sparse. *Inflorescence* 5–*c.* 120-flowered from up to 4 nodes, without or very rarely with 1–2 flowering branches from next lower node, pyramidal or shortly cylindric to corymbiform, lower nodes not distinct, the partial inflorescences nearly always lax-flowered when mature; pedicels 1–4 mm; bracts and bracteoles linear, black-glandular-ciliate, densely glandular-auriculate. *Flowers* 15–25 mm in diam.; buds cylindric-ellipsoid, obtuse. *Sepals* (4–)5–6(–8) × 1–1.5 mm, subequal, free or almost so, narrowly oblong to narrowly lanceolate, acute or very rarely subacute, with margin long- to short-glandular-ciliate; veins 5 or 3 with strong near-basal outer branch from each lateral, these sometimes united (commissural) at base; laminar glands all pale to all black, linear at base or all striiform to punctiform; marginal glands black, flat-topped. *Petals* pale (?) to golden yellow, sometimes veined or tinged red, (8–)10–13(–15) × (2.5–)3–3.5 mm, *c.* 2 × sepals, oblong-lanceolate, rounded, apiculus absent; laminar glands pale and/or black, scattered; marginal glands absent. *Stamens c.* 20–40, longest (7.5–)9–10 mm, 0.65–0.8 × petals; anther gland black. *Ovary* 2–3 × 1–2 mm, narrowly ovoid-pyramidal; styles 6–8 mm, 2–4 × ovary, spreading-incurved. *Capsule* (4–)5–8 × 2.5–4 mm, ovoid, equalling or exceeding sepals, enclosed when developing by petals twisting together. *Seeds* dark yellow-brown, 0.6–0.7 mm long; testa linear-reticulate. 2n = 16 (Reynaud, 1980; Strid & Franzén, 1981: 836).

Dry or stony places, in scrub or grassland; 1212 m (Sardinia), 300–*c.* 1330 m (Balkans), 1050–1725 m (Arabia), 1600–3000 m (Ethiopia), 1100–2700 m (East Africa).

Sardinia; Serbia, Macedonia, Albania, Bulgaria; Saudi Arabia (Jebel Fayfa); E. Sudan, Ethiopia (Eritraea to Tigray and Beghemder; Harar); E. Uganda, SW Kenya, N. Tanzania.

H. annulatum is very closely related to 17. *H. montanum* (q.v. for differences), being its sister species and the basal species of a group comprising the remaining species in sect. *Adenosepalum* (Spp. 19–24). It varies in pubescence and glandularity over its widely disjunct areas of distribution. The European populations have pubescent stems and leaves and vary in the length of sepal cilia, and they lack superficial or laminar black glands. The northern Ethiopian, Sudanese and Arabian populations show parallel trends north-eastward from Tigray to Arabia in pubescence (sparsely pubescent to glabrous stems and leaves), glandularity (black glands on stem, sepals and petals absent or present) and sepal cilia (long to short). The southern (Harar) plants tend towards the East African population in density of pubescence, in the presence of occasional black glands on the leaves, and (rarely) in having red tinges on the petal veins, but are otherwise like the northern group. The East African population varies in pubescence (stems and leaves densely pubescent to glabrous) and glandularity (black or red glands always on stems and petals, sometimes on leaves and sepals), but the sepal cilia are always long and the petals always red-tinged. The overlaps in variation preclude the recognition of any of these populations at specific level, but three variable subspecies can be distinguished. Subsp. *annulatum* comprises the European populations, subsp. *intermedium* most of the north-east African and Arabian populations and subsp. *afromontanum* the Harar and east African populations. For a key to these subspecies, see p. 172.

18a. **Hypericum annulatum** subsp. **intermedium** (Steud. ex A. Rich.) N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 69 (1993). Type as for *H. intermedium* Steud. ex A. Rich.

Map 39.

H. intermedium Steud. ex A. Rich., *Tent. fl. abyss.* **1**: 95 (1847); Oliv., *Fl. Trop. Afr.* **1**: 155 (1868) pro parte quoad typum; Engler in *Phys. Abh. K. Akad. Wiss. Berlin* **1891**: 306 (1892); *Hochgebirgsfl. Trop. Afr.*: 306 (1892); T.C.E. Fr. in *Notizbl. Bot. Gart. Berlin* **8**: 566 (1923). Types: Ethiopia, ad latus boreale montium altiorum prope Adoam, 20 November 1838 (fl), *Schimper* II 1062 (P-lectotype; BR, FI, G, K!, LE, MO-isolectotypes); without precise locality or date, *Quartin-Dillon & Petit* 37 (P-syntype).

H. annulatum sensu Cufod. in *Bull. Jard. bot. Brux.* **29**, Suppl.: 588

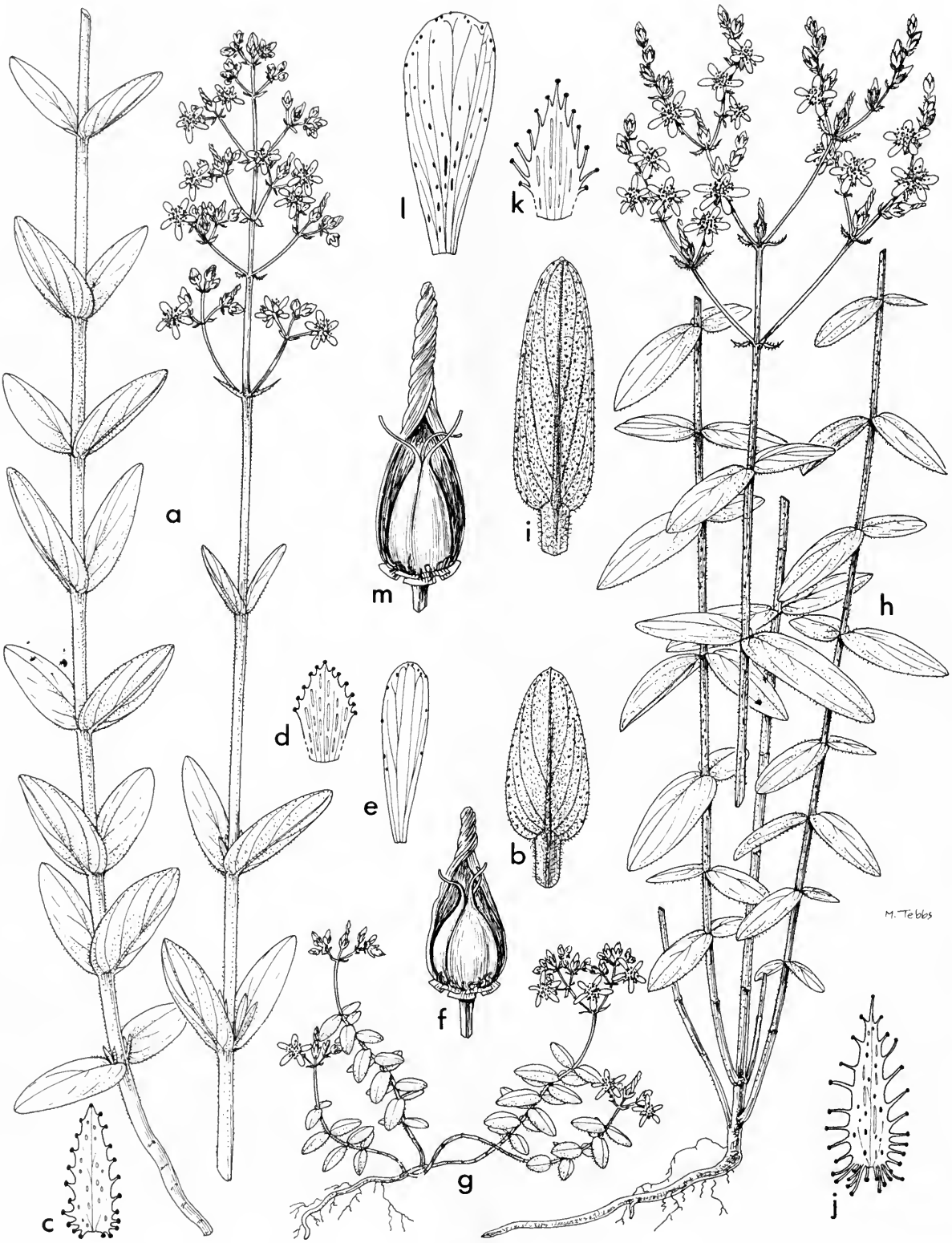
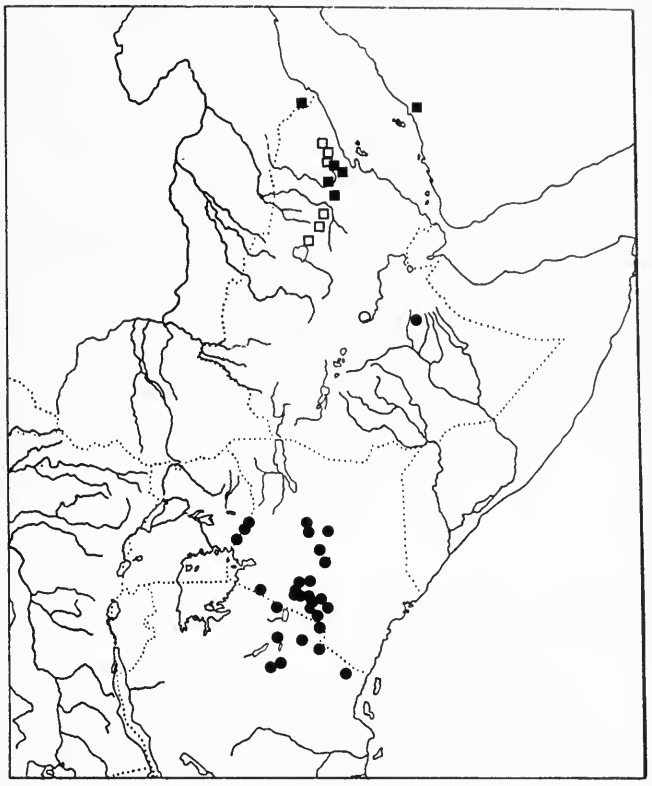


Fig. 29 A. *H. lanuginosum*: (a) habit; (b) leaf; (c) bract; (d) sepal; (e) petal; (f) capsule. B. *H. cuisinii:* (g) habit. C. *H. annulatum* subsp. *afromontanum*: (h) habit; (i) leaf; (j) bract; (k) sepal; (l) petal; (m) capsule (a, g, h × ½; b, i × 1; c-f, j-m × 3). A. *Bornmüller* 11525. B. *Schlieben* 5062. C. *Guiol* 2295.



Map 39 Sect. 27: 18. *H. annulatum*: a. subsp. *intermedium* specimens ■, records □; c. subsp. *afromontanum* specimens ●, records ○.

(1959); Moggi & Pisacchi in *Webbia* **22**: 272, f. 12 (1967); Collen., *Fls Saudi Arabia*: 261 & photograph (1985).

H. intermedium forma *obtusifolium* R. Keller ex Moggi & Pisacchi in *Webbia* **22**: 272 (1967), in synon.

Icon: Moggi & Pisacchi in *Webbia* **22**: 272, f. 12 (1967).

Stem without or rarely with few black glands, sparsely puberulous to glabrous. *Leaves* without laminar black glands, ± sparsely and very shortly pubescent to puberulous or glabrous. *Sepals* short- to long-glandular-ciliate (i.e. cilia shorter to 2 or more times as long as glands), occasionally with some laminar glands black. *Petals* with few (rarely more numerous) punctiform laminar black glands, rarely red-veined in bud.

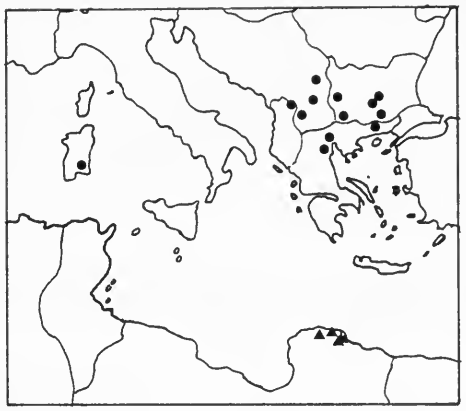
Saudi Arabia (Asir), Sudan Republic (S. Red Sea Hills), N. Ethiopia (Eritraea to L. Tana and N. Shoa).

SAUDI ARABIA. Asir: Jabal Fayfa, 100 km NE of Jizan, 1500 m, 10 April 1982 (fl), *Collenette* 3536 (E, K); loc. cit., 1725 m, 28 March 1988 (fl), *Collenette* 6625 (E*, K); loc. cit., 14 April 1982 (fl), *Grainger* 578 (E).

SUDAN REPUBLIC. Kassala, Red Sea Hills, Diris Pass, 1700 m, 10 April 1953 (fl), *Jackson* 2867 (K).

ETHIOPIA. Eritraea: sul monte Matara, 20 September 1902 (fl), *Pappi* 905 (BM, K); Asmara to Massawa, *c.* 17 km, 1800 m, 5 February 1969 (fl & fr), *De Wilde* 4565 (K); Ad Teclesan, 2100 m, 20 March 1944 (fl), *Bally* 6660 (K). Tigray: vom Scholloda bei Adoa, 2010 m, 15 August 1862 (fr), *Schimper* 37 (BM, E*); prope Adowa, 1 March 1837 (fl), *Quartin-Dillon & Petit* s.n. (K). Shoa: Alia Amba, October 1842 (l. fl), *Roth* 193 (K). Begemdir: Simien Mts and Gondar (Moggi & Pisacchi, 1967).

Subsp. *intermedium* varies north-eastward by decreasing pubescence and increasing glandularity, so that the Sudanese and Arabian plants are glabrous with black-gland-dotted sepals and stems. The Arabian plants also have sepals with short glandular cilia, whereas in the others they are medium to long. The eastern Ethiopian population has more in common with the East African plants and has therefore been included in subsp. *afromontanum*.



Map 40 Sect. 27: 18. *H. annulatum*: b. subsp. *annulatum* ● (see also Map 41); 24. *H. decaisneanum*▲.

18b. **Hypericum annulatum** subsp. **annulatum**
Maps 40, 41.

H. atomarium sensu Velen., *Fl. Bulg.*: 105 (1891); Stjep.-Vesel. in Josifović, *Fl. Srbije* **3**: 112, t. 32 ff. 2, 2a (1972).

H. perfoliatum var. *annulatum* (Moris) Fiori in Fiori & Paoletti, *Fl. Italia* **1**: 389 (1898), *Nuov. Fl. Italia* **1**: 524 (1924).

H. degenii Bornm. in *Magyar Bot. Lap.* **9**: 90 (1910); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, tt. 2 f. 20, 3 f. 34 (1932), **11**: 165 (1933), **12**: 85 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Jordanoff & Kozuh. in Jordanoff, *Fl. R. P. Bulgaricae* **4**: 239, t. 45 f. 1 (excl. δ) (1970). Types: Bornmüller cited nine syntype specimens, four from Serbia and five from Bulgaria. As there is no apparent reason for choosing any particular specimen as lectotype, I have selected the most widely distributed collection: Bulgaria, in rupestribus ad Stanimaka, June 1894 (l. fl), *Stříbrný* s.n. (BP!-lectotype; BM!, FR!, K!).

H. atomarium subsp. *degenii* (Bornm.) Hayek, *Prodr. fl. pen. Balc.* **1**: 536 (1925).

Icones: Moris, *Fl. Sardoa* **1**: t. 22 (1837); Chiappini, *Fl. paesag. veg. Sardegna*: t. 11 (1985); Jordanoff, *Fl. R. P. Bulgaricae* **4**: t. 45 f. 1 (excl. δ) (1970).

Stem without red or black glands, densely short-pubescent. *Leaves* without laminar black glands, densely short-pubescent. *Sepals* long- to short-glandular-ciliate (i.e. cilia shorter than to 2 or more times as long as glands), with laminar glands all pale. *Petals* without punctiform laminar black glands, not tinged red in bud. 2n = 16 (see p. 199).

SARDINIA. Monte Santa Vittoria di Esterzili, 1212 m, 25 August 1965 (fr), *Bongoni* 556 (BM); Nodu 'e Littipori (*fide* Arrigoni et al., 1973).

SERBIA. Prope Niš, June 1894 (fl), *Adamovič* s.n. (FR, K); prope Alpačkavica, 17 June 1895 (fl), *Adamovič* s.n. (K); ad Markovo Kale sub monte Kostilovitza prope Vranjos, June 1896 (fl), *Adamovič* s.n. (K).

MACEDONIA. Treska gorge, *c.* 400 m, 8 June 1937 (fl), *Rev. & Mrs H.P. Thompson* 877 (K).

ALBANIA. Shkodra: Bertiscus, in valle rivuli Ločanska Bistrica, *c.* 700 m, 17–19 July 1933 (fr), *K.H. Rechinger & Scheffer* 1036 (BM, K).

BULGARIA. Sofiya: circa Dragoman, July 1896 (fl), *Jovanitz* s.n. (K). Blagoevgrad [Gorna Dzhumavo]: Melnik, Tal zwischen Melnik und Rózen-Kloster, 13 June 1971 (fl), *F.K. & J. Meyer* 10235 (BM, JE). Plovdiv: infra pagum Bačkovo, oppidum Asenovgrad [Stanimaka] versus, 300 m, 12 June 1973 (fl), *Greuter* 11175 (H); ad Papozli, June 1910 (fl & fr), *Stříbrný* s.n. (H); Asenovgrad, Westhänge entlang das Flusses oberhalb Batschkovo-

Kloster, 24 June 1961 (fl), *Bisse & Schneider* 376 (JE), 377 (BM). Khaskovo: near Boju, valley to Daridere, 17 July 1926 (fl), *Turrill* 1444 (K).

SWITZERLAND (subspontaneous). Zürich: Stäfa, 430 m, 12 July 1981 (fl & fr), *Kramer* 7500 (BM).

CULTIVATED. Specimens seen from England (1929, herbarium and 1994, living) and Sweden (1973).

Subsp. *annulatum* varies somewhat in leaf width, but neither this character nor the sepal cilia length (shorter than or equalling gland in Sardinia, usually exceeding gland by up to *c.* 6 times in Balkans) can be used to separate these geographically widely separate populations.

18c. **Hypericum annulatum** subsp. **afromontanum** (Bullock) N. Robson in *Bull. nat. Hist. Mus. Lond.* (Bot.) **23**: 69 (1993). Type as for *H. afromontanum* Bullock.

Fig. 29C, Map 39.

H. afromontanum Bullock in *Kew Bull.* **1932**: 492 (1932); Hedberg in *Symb. bot. Upsal.* **15**(1): 131 (1957); Agnew, *Upland Kenya wild fls*: 186 (1974). Type: Kenya, Mt Elgon, 3540 m, December 1930 (fl), *Major E.J. & Mrs C. Lugard* 338a (K!-holotype; BM! '338').

H. annulatum sensu Milne-Redh. in *Kew Bull.* **8**: 435 (1953); Moggi & Pisacchi in *Webbia* **22**: 272, f. 13 (1967) pro parte; Agnew, *Upland Kenya wild fls*: 186 (1974); N. Robson in Bamps, Robson & Verdcourt, *Fl. trop. E. Afr.,* Guttif.: 30 (1978).

Icon: Agnew, *Upland Kenya wild fls*: 185 (1974).

Stem usually with numerous black (or very rarely red) glands, densely to sparsely puberulous or rarely glabrous. *Leaves* sometimes with few to numerous laminar black glands, puberulous above and densely pubescent beneath or very rarely wholly glabrous. *Sepals* long-glandular-ciliate (i.e. cilia more than twice as long as glands), usually with some or all laminar glands black. *Petals* with few distal or numerous scattered punctiform laminar black glands, always? red-tinged in bud.

SE Ethiopia (Harar), East Africa (eastern Uganda, south-western Kenya, northern Tanzania).

ETHIOPIA. Harar: Gara-muleta, 2550 m, 23 October 1960 (fl), *I.E.C.A.M.A.* J-54 (K); Gara Mullata mtn, ± 3060 m, 24 November 1962 (fr), *Burger* 2394 (K).

UGANDA. Eastern: Mbale Distr., Mt Elgon, Bupota [Bupoto], 1500 m, 7 August 1917 (fl & fr), *Snowden* 522 (BM, K); Bugishu Distr., Mt Elgon, W. slope above Butaderi, 3500 m, 5 December 1967 (fl), *Hedberg* 4488 (K).

KENYA. Northern Frontier: Mathews Range, Dunyus, 2100 m, 25 June 1944 (fl & fr), *Bally* 3610 (K); 24 km N. of Maralal on road to Baragoi, 2180 m, 26 October 1978 (fr), *Gilbert* et al. 5156 (K). Turkana: West Suk Distr., Kitale to Moroto, *c.* Km 64, 4 October 1952 (l. fl), *Verdcourt* 747 (K). Rift Valley: Naivasha Distr., Longonot, 2700 m, March 1922 (fl), *Dummer* 5133 (K); Ravine Distr., 2nd day's march from Eldama Ravine, November 1898 (fl), *Whyte* s.n. (K). Central: Kitui Distr., Galunka, 30 May 1902 (l. fl & fr), *Kässner* 873 (BM); Machakos Distr., *c.* 5.6 km N. of Nunguni, Kilungu Location, 1800 m, 11 June 1967 (fl), *Mwangangi* 58 (K); Meru Distr.?, Mt Kenia septentrionalis inter flumina Liki et Kongoni, 12 February 1922 (e. fr), *R..E. & T.C.E. Fries* 1488 (K). Masai: Ngong Hills, S. slopes above Magadi road, 5 August 1957 (fl), *Greenway* 9221 (K); Kilmandsharo, N. Seite, Loiokitok [Laiokitok], 1850 m, 11 April 1934 (fr), *Schlieben* 5062 (BM, K, Z).

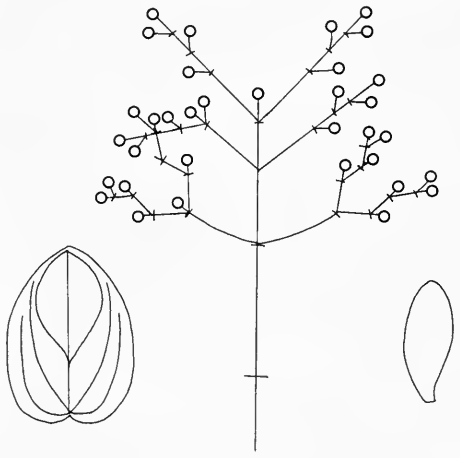
TANZANIA. Northern: Masai Distr., Ol Doinyo Loldadwenya, 3000 m, 27 January 1962 (fl), *Newbould* 5903 (K); Arusha Distr., Songe Hill, near Telegraph Hill, 2011 m, 23 February 1969 (fl & e. fr), *Richards* 28184 (K); Mbulu Distr., Shesheda to S. of Gendabi, Mt Hanang, 2250 m, 10 February 1946 (fl), *Greenway* 7678 (K). Tanga: W. Usambaras, Gologolo – Mkumbala footpath, 1800 m, 4 June 1953 (fl), *Drummond & Hemsley* 2866 (K); Hambalai Scarp, 1800 m, January 1933 (fl), *Mr & Mrs Moreau* 45 (K).

Subsp. *afromontanum* is characterized by an increase of black glands (stem, leaves, sepals, petals), constant long sepalline cilia and red-tinged petals, and the almost constant occurrence of indumentum on stem and leaves. In these characters the Harar population from Ethiopia agrees with the East African plants except for the absence of black glands on the stem.

The type of *H. afromontanum* belongs to an upland form with a condensed inflorescence; but this cannot be separated from the lower-altitude form with the typical, widely spreading lax inflorescence on account of numerous intermediate specimens.

19. **Hypericum delphicum** Boiss. & Heldr. in Boiss., *Diagn. pl. orient.* II, **1**: 106 (1853); Boiss., *Fl. orient.* **1**: 807 (1867); Halácsy, *Consp. fl. graec.* **1**: 282 (1900); Hayek, *Prodr. fl. pen. Balc.* **1**: 535 (1925); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Turrill in *Kew Bull.* **1932**: 248 (1932); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 3 (1932), **11**: 164 (1933), **12**: 85 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Rech. f. in *Beih. Bot. Centralbl.* **54B**: 617 (1936), *Fl. aegaea*: 264 (1943); N. Robson in Tutin et al., *Flora Europaea* **2**: 265 (1968); Polunin, *Fls Greece & Balkans*: 337 (1980); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 73 (1995). Type: Greece, Evvoia, 'prope Steni ad radices montis Delphi Eubeae', 450 m, August 1848 (e. fr), *Heldreich* s.n. (G!-holotype; BM!, H!, K!).

Map 41.



Perennial herb 0.11–0.35(–0.45) m tall, erect to ascending from creeping, rooting and branching base, with herbaceous taproot, usually several-stemmed, unbranched below inflorescence, strigose-pubescent on stems below inflorescence and on both surfaces of leaves. *Stems* green, terete; internodes exceeding to shorter than leaves, eglandular. *Leaves* sessile; lamina 12–35 × 9–29 mm, oblong-ovate to broadly ovate, concolorous, thinly chartaceous, not glaucous, equally and rather sparsely hirsute on both sides, more densely so along veins beneath, plane, spreading; apex rounded, margin entire, base rounded to shallowly cordate; venation: 3–4 pairs of laterals curved-ascending from lower 0.25–0.4 of midrib, tertiary reticulation dense, slightly prominent; laminar glands pale, dense, subequal; intramarginal glands black, dense to rather sparse. *Inflorescence* 4–*c.* 90-flowered from 1–3 nodes, without flowering branches below, shortly cylindric to corymbiform, dense; pedicels 1.5–2 mm; bracts and bracteoles lanceolate to linear-lanceolate, black-glandular-ciliate, densely glandular-auriculate. *Flowers* 12–15(–20?) mm in diam.; buds ellipsoid-subglobose, rounded. *Sepals* 3–6 × 1–1.5 mm, equal, free, narrowly oblong to narrowly elliptic,

acute to subacute, with margin long-glandular-ciliate; veins 3, prominent, outer ones branching; laminar glands pale, striiform to punctiform; marginal glands black, flat-topped. *Petals* rather pale yellow, 7–9 × 2.5–3 mm, 2.5–3 × sepals, oblong-elliptic, rounded, apiculus absent; laminar glands pale, sometimes few; marginal glands distal, black, immersed or ± prominent. *Stamens c.* 20–35, longest 7–9 mm, equalling petals; anther gland black. *Ovary c.* 2 × 1 mm, ellipsoid; styles 5–6 mm, 2.5–3 × ovary, spreading-incurved. *Capsule* 4–5 × 2.5–3 mm, broadly ellipsoid, shorter than to exceeding sepals, enclosed when developing by petals twisting together. *Seeds* dark brown, 0.6 mm long; testa finely reticulate-scalariform. 2n = 16 (Reynaud, 1980).

Damp and shaded places among rocks; 300–1700 m.

Greece (Evvoia, Andhros).

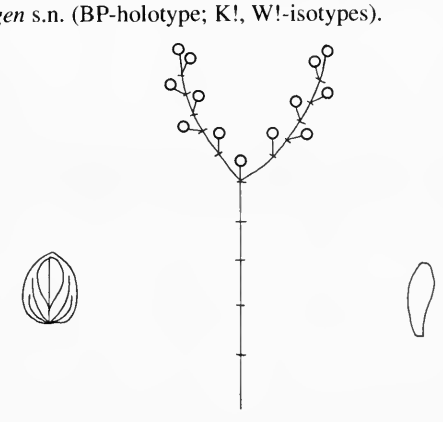
GREECE. Evvoia: Distr. Halkis, village Steni (Dirfis), 450 m, 4 June 1969 (fl), *Stamatiadou* 6465 (ATH*, BM); in monte Xerowuni [Xirovouni], ad pagum Steni, *c.* 600–800 m, 13–17 July 1932 (l. fl), *K.H. Rechinger* 2614 (BM). Platana prope Kymi, 25 August–8 September 1966 (fr), *K.H. Rechinger* 3785 (W); valley SW of Mt Ophir, 25 August 1981 (e. fr), *Akeroyd & Preston* 1381 (BM, CGE*). Andhros: Panagia, Panáchrantos, 30 October 1939 (fr), *Davis* 1020 (BM, K); between village Falika and monastery Panahrantou, 300–500 m, 11 June 1969 (fl), *Stamatiadou* 6581 (ATH*, BM).

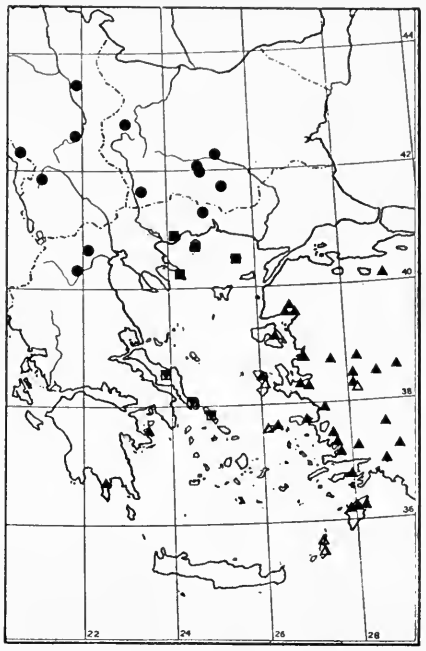
H. delphicum is clearly a derivative of 18a. *H. annulatum* subsp. *annulatum*, differing from it in the shorter, creeping and branching stems, the rougher indumentum and (apart from the high-altitude form of subsp. *afromontanum*) the more condensed inflorescence. It has a relict distribution, being restricted to isolated areas in Evvoia and Andhros, and, in turn, is related (ancestral?) to 20. *H. athoum*.

20. **Hypericum athoum** Boiss. & Orph. in Boiss., *Fl. orient.* **1**: 794 (1867); Hayek, *Prodr. fl. pen. Balc.* **1**: 535 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 85, t. 3 f. 32 (1932), **11**: 164 (1933), **12**: 84 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Ade & Rech. f. in *Repert. Nov. Sp.*, Beih. **100**: 122 (1938); Rech. f., *Fl. aegaea*: 264 (1943); N. Robson in Tutin et al., *Fl. Europaea* **2**: 265 (1968); N. Robson & Strid in Strid, *Mtn Fl. Greece* **1**: 602, f. 35.6 (1986); Greuter, Burdet & Long, *Med-Checklist* **3**: 264 (1986); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 73 (1995); non *H. montanum* var. *athoum* Griseb., *Spic. fl. rumel.*: 224 (1843). Type: Greece, Makhedonia, in fissuris rupium regionis superioris montis Athos Macedoniae, n.d. (fl), *Orphanides* 240 (G!- holotype).

Map 41.

H. sanctum Degen in *Oesterr. Bot. Zeitschr.* **41**: 333 (1891); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 178 (1925). Type: Greece, Thraki, Samothráki, in saxosis umbrosis ad torrentes montis Phengari [Pengári], 800 m, 28 June 1890 (l. fl), *Degen* s.n. (BP-holotype; K!, W!-isotypes).





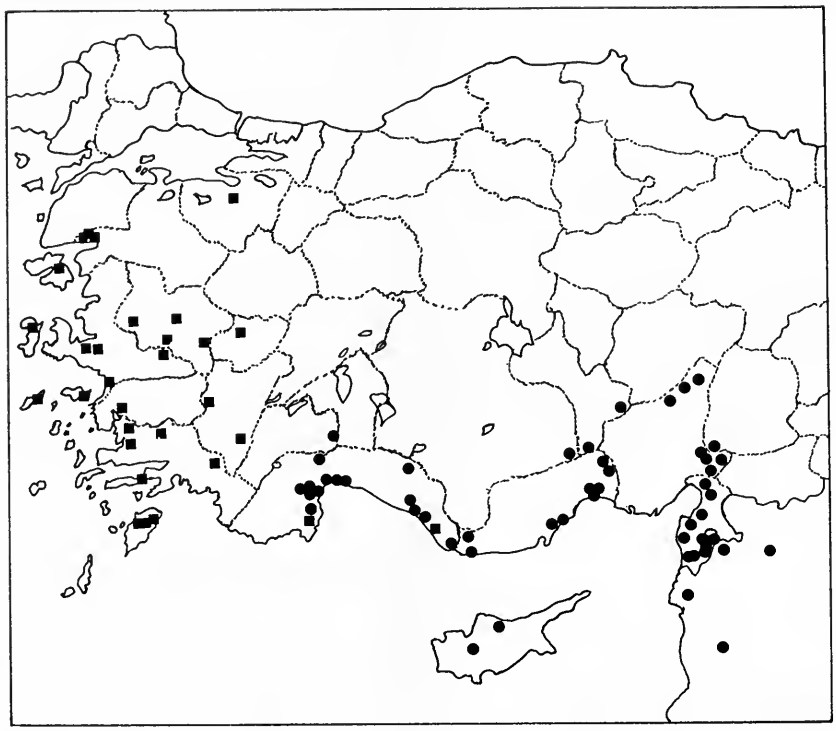
Map 41 Sect. 27: 18. *H. annulatum*: b. subsp. *annulatum* (part) ● (see also Map 40); 19. *H. delphicum* □; 20. *H. athoum* ■; 21. *H. atomarium* (part) ▲; 22. *H. cuisinii* Δ.

Perennial herb with stems 0.1–0.25 m long, weak, procumbent from creeping, rooting and branching base, with herbaceous taproot, many-stemmed, unbranched and densely to rather sparsely pilose below inflorescence. *Stems* green, terete; internodes exceeding leaves, eglandular. *Leaves* with petiole 0.5–1.5 mm; lamina 8–15 × 5–10 mm, broadly ovate or suborbicular to rather broadly elliptic, concolorous, thinly chartaceous, not glaucous, softly patent-pubescent above, villous beneath, more densely so along veins, plane, spreading; apex rounded, margin entire, base broadly cuneate to truncate or subcordate; venation: 3 pairs of laterals curved-ascending from lower 0.35–0.4 of midrib, tertiary reticulation rather dense, obscure, not prominent; laminar glands pale, rather dense (but absent near midrib), subequal; intramarginal glands black, rather dense to sparse. *Inflorescence* (1)2–7(–11)-flowered from terminal node, without flowering branches below, V-shaped, rather dense; pedicels 1–2.5 mm; bracts and bracteoles lanceolate, black-glandular-ciliate, at least lowermost pair rather densely glandular-auriculate. *Flowers c.* 10 mm in diam.; buds ellipsoid, rounded. *Sepals* 3.5–4.5 × 0.8–1.2 mm, equal, free or shortly united, lanceolate to narrowly elliptic, acute, with margin long-glandular-ciliate; veins 3, outer ones sometimes branching; laminar glands pale, striiform to punctiform; marginal glands black, flat-topped. *Petals* rather pale yellow, faintly veined red, 7–9.5 × *c.* 2 mm, 2–2.5 × sepals, elliptic, obtuse, apiculus absent; laminar glands absent; marginal glands subapical, black, few, sessile or on short cilia. *Stamens c.* 25, longest 5–6 mm, *c.* 0.7 × petals; anther gland black. *Ovary* 2.5 × 1.5 mm, ellipsoid; styles *c.* 5 mm, 2 × ovary, spreading. *Capsule c.* 4.5 × 2.5 mm, ellipsoid, about equalling sepals, enclosed when developing by petals twisting together. *Seeds* dark red-brown, 0.6 mm long; testa shallowly and finely reticulate-scalariform.

Rock crevices and rocky places in shade, on limestone (marble) or gneiss; 700–2000 m.

Greece (Athos Peninsula, Thasos, Samothráki).

GREECE. Makhedonia: Ayion Oros, Mt. Athos (see type); Kavalla, in monte Pangaeon (Purner-Dagh), 1600 m, 26–27 June 1936 (fl), *K.H. Rechinger*



Map 42 Sect. 27: 21. *H. atomarium* (part) ■ (see also Map 41); 23. *H. lanuginosum* (part) ● (see also Map 43).

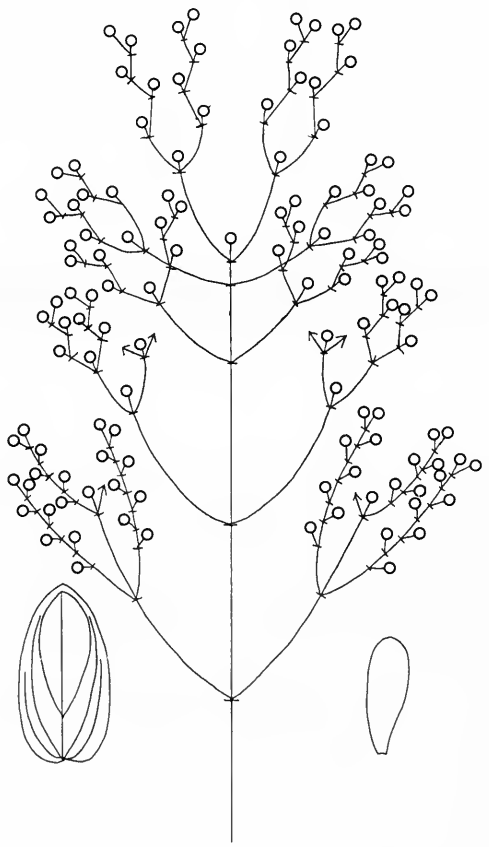
10247 (BM, K); Thasos, Mt. Ipsárion, W. end of valley above Potamia, *c.* 850 m, 21 July 1927 (fl), *Akeroyd & Preston* 584 (BM, CGE*). Thraki: Samothráki, above Ano Kariotai, 700 m, 27 July 1980 (l. fl & fr), *Akeroyd & Preston* 891 (BM, CGE*).

H. athoum is closely related to 19. *H. delphicum*, differing from it in the spreading, more delicate habit, smaller petiolate leaves, softer indumentum and smaller- and fewer-flowered inflorescence. It has a similarly disjunct distribution relative to 18. *H. annulatum* subsp. *annulatum*, but in the north Aegean region.

21. **Hypericum atomarium** Boiss., *Diagn. pl. orient.* I, **8**: 114 (1849), *Fl. orient.* **1**: 808 (1867); Halácsy, *Consp. fl. graec.* **1**: 282 (1900); Bornm. in *Mitt. Thür. Bot. Ver.* **24**: 26 (1908); Hayek, *Prodr. fl. pen. Balc.* **1**: 535 (1925) pro parte quoad subsp. *eu-atomarium* Hayek; R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925) pro parte; Rech. f. in *Ann. Naturhist. Mus. Wien* **43**: 305 (1929); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 164 (1933), **12**: 85 (1934) pro parte, excl. syn. *H. millepunctatum* Holmboe praeter spec. *Sintenis* 602, in *Pflanzenareale* **4**(1): Karte 4a (1933); Rech. f., *Fl. aegaea*: 246 : (1943); N. Robson in *Notes R.B.G. Edinb.* **27**: 196 (1967), in Davis, *Fl. Turkey* **2**: 387 (1967), in Tutin et al., *Fl. Europaea* **2**: 266 (1968); Greuter, Burdet & Long, *Med-Checklist* **3**: 264 (1986); Carlström, *Surv. Fl. Phytogeogr. Rodhos, (etc.)*.: 63, map 309 (1987); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72 (1995). Type: Turkey, Manisa or Izmir, in dumosis montis Sipyli supra Magnesium [Manisa] in Lydia, June 1842 (fl), *Boissier* s.n. (G!-holotype).
Maps 41, 42.

H. hirsutum sensu Sibth. & Sm., *Fl. Graecae Prodr.* **2**: 117 (1813); Chaub. & Bory, *Exped. sci. Morée* **3**: 152 (1832), *Nouv. fl. Pélopp.*: 53 (1838).
H. lanuginosum sensu d'Urv., *Enum. pls Ponti-Eux.*: 58 (1822); Friedr., *Reise Neu-Griechenland*: 273 (1838).

H. supinum Vis. in *Atti Riun. Sci. ital.*: 175 (1841), *Ill. piante Grec. Asia minore*: 17 (1842); Mabberley in *Taxon* **31**: 71 (1982), pro min. parte omnes. Types: Turkey, Balikesir?, circa Antandro ad sinum Golfo 'Adramitti [Edremit] dictum, 1819 (fl), *Parolini &*



Webb s.n. (PAD!-syntype). The other syntype belongs to *H. tomentosum* L. var. β; see Robson (1967*a*: 196), where it was chosen as lectotype of *H. supinum* Vis.

H. lanuginosum subsp. *atomarium* (Boiss.) Holub (description not traced).

Perennial herb 0.2–0.8 m tall, erect or decumbent but not rooting at base, with ± woody taproot, few-stemmed, unbranched below inflorescence or with short axillary shoots after fruit ripens, shortly whitish-pubescent on stems below inflorescence and on both leaf surfaces. *Stems* green, terete; internodes all shorter than leaves or upper (or more rarely all) exceeding them. *Leaves* sessile; lamina 15–45(–55) × 8–20(–22) mm, ovate to oblong or elliptic, paler beneath, thinly chartaceous, not glaucous, shortly pubescent beneath, usually shorter or puberulous above, plane, spreading; apex rounded, margin entire, base cordate-amplexicaul to rounded; venation: 3 pairs of laterals curved-ascending from lower 0.2–0.25 of midrib, tertiary reticulation dense, not or scarcely prominent; laminar glands all pale or sometimes scattered black ones distally and towards margin, dense to rather sparse, ± unequal; intramarginal glands black, dense to rather sparse. *Inflorescence* (12–)15–*c.* 200-flowered from (2–)5–8 nodes, without flowering branches from lower nodes, cylindric to rarely shortly and broadly rounded-pyramidal; pedicels 2–3 mm; bracts and bracteoles triangular-lanceolate to linear, black-glandular-ciliate, often with basal cilia somewhat longer but not auriculate. *Flowers* 15–20 mm in diam.; buds cylindric, rounded. *Sepals* 3.5–5 × 1–2.2 mm, subequal, free or almost so, ± narrowly oblong or oblong-lanceolate to elliptic or rarely lanceolate to ovate, obtuse (rarely acute) to rounded, with margin long-glandular-ciliate; veins 3, outer sometimes branched; laminar glands pale, striiform; marginal glands black, flat-topped. *Petals* pale yellow, not tinged red, (8–)9–12 × 3–3.5 mm, *c.* 2.5 × sepals, elliptic to oblanceolate, rounded, apiculus absent; laminar glands pale, punctiform to striiform, and also usually black, punctiform, scattered; marginal glands absent. *Stamens* 25–40, longest 6–8 mm, *c.* 0.65 × petals; anther gland black. *Ovary* 1.5–3 × 1–1.5 mm, ellipsoid; styles 3.5–5.5 mm, 1.9–2.3 × ovary, spreading-incurved. *Capsule* 5 × 3 mm, broadly ellipsoid, equalling or exceeding sepals, enclosed when developing by petals twisting together. *Seeds* dark reddish brown, 0.5–0.6 mm long; testa finely scalariform. 2n = 16 (Reynaud, 1973, 1980, 1981).

Stony places (schist or limestone) near streams or in damp shade; 30–1000 m.

Greece (E. Peloponnisos: Lakonia, Argolis; E. Aegean islands: Lesvos, Khíos, Ikaría, Samos, Rhodos), Turkey (W. Anatolia from Bursa to Antalya). Naturalized in Portugal (cf. Ramos, 1993: 184).

GREECE. Lakonia: Mt. Taygète [Taiyetos], 1975 (fl), *Contandriopoulos* 75–259 (MARS). Argolis: Poros, prope Poros, 1 June 1867 (fl), *Heldreich* 252 (BM, K). Lesvos: Mytilini (Lesbos), ad Philia, *c.* 300 m, 18–24 May 1934 (fl), *K.H. Rechinger* 5899 (BM, K). Khíos: Amádhes, 31 May 1939 (fl), *Platt* 233 (K). Ikaría: village Hristostomos, 300–350 m, 28 May 1970 (fl), *Stamatiadou* 9106 (ATH*, BM). Samos: Vathy, 16–23 June 1932 (l. fl), *K.H. Rechinger* 1897 (BM). Rhodos: below Salakos, 300–350 m, 22 October 1981 (e. fr), *Davis* 67985 (E); from Rhodes to Afantou, 27 May 1971 (fl), *Fagerstén* s.n. (H).

TURKEY. Bursa: prope Brussam, May 1874 (fl), *Pichler* 72 (K). Balikesir: Ak-Tchai, ad Seitinlÿ, 11 June 1883 (fl), *Sintenis* 602b (E); Mt. Ida [Kaz dağ], prope Kareikos, 19 July 1883 (fl), *Sintenis* 602 (BM, E, FR, G, JE, K, U). Manisa: Salikli, Banya, 250 m, 10 June 1935 (fl), *Wall* s.n. (S); Kula, 700 m, 21 June 1965 (fl), *Coode & Jones* 2816 (E). Uşak: Ouchak (Phrygie), 910 m, 15 July 1857 (fl), *Balansa* 1158 (BM, E, FR, G, JE, K, U). Izmir: Selçuk, Efes [Ephesus], 3 May 1972 (fl), *E. & G. Sezik* 262 (BM); Odemis distr., Bozdağ, 1300 m, 16 August 1950 (l. fl) *Davis* 18230 (E). Aydin: Söke to Milaş, 25 May 1962 (fl), *Dudley* D. 34994 (K); Çamlik – Selçuk, 6 km, 30 m, 22 June 1954 (fl), *Huber-Morath* 12269 (G). Muğla: Sandras dağ near Ağla, 600 m, 25 July 1947 (fr), *Davis* 13638 (E, K); Datça to Marmaris, 6 km from Emiçk, 110 m, 7 June 1962 (fl), *Dudley* D. 35448 (K). Denizli: Boz dağ near Geyran Yayla, 16 July 1947 (fl), *Davis* 13347 (E, K); Babadağ, above Kadiköy, 900 m, 8 June 1951 (e. fr), *Davis* 18426 (E), 18426A (K). Antalya: from Alanya to Gazipaşa, 15 km, 3 June 1973 (fl), *Himmetoğlu* 580 (BM).

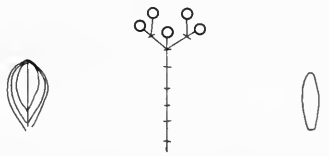
H. atomarium is very closely related to 18a. *H. annulatum* subsp. *annulatum*, differing from it essentially in lacking proper auricles on the bracts and bracteoles and in having laminar black glands on the sepals, usually on the petals and sometimes on the leaves. This last character also distinguishes it from its sister species, 23. *H. lanuginosum*, in which the sepals are usually more obtuse with shorter glandular cilia. *H. atomarium* and *H. lanuginosum* together form a south-eastern development from the Balkan *H. annulatum*, a population which split into a western and an eastern species. The laminar black gland character separates them well; although there are relatively few black glands on the sepals of the 'outlying' Antalya specimen cited above, they are numerous on the leaves. However, variability towards the western end of the distribution of *H. lanuginosum* (q.v.) may well indicate introgression from *H. atomarium*.

See 22. *H. cuisinii* for a discussion of the relationships of that species to *H. atomarium*.

22. **Hypericum cuisinii** Barbey in *Bull. Soc. vaud. Sci. nat.* **21**: 220 (1886), ['*cuisini*']; Boiss., *Fl. orient.*, Suppl.: 127 (1888); Hayek, *Prodr. fl. pen. Balc.* **1**: 535 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 28 (1932), **12**: 84 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Rech. f., *Fl. Aegaea*: 264 (1943); N. Robson in P. Davis, *Fl. Turkey* **2**: 387 (1967), in Tutin et al., *Fl. Europaea* **2**: 266 (1966); Greuter, Pfleger & Raus in *Willdenowia* **13**: 58 (1983); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986); Turland, Chilton & Press, *Fl. Cretan area*: 93, map 675 (1993). Type: Greece, Karpathos, in declivibus lapidosis montis Elympo insula Karpathos, May 1883 (fl), *Pichler* 139 (G!-holotype; E!, K!).

Fig. 29B, Map 41.

Icon: Stefani, Major & Barbey, *Karpathos*: t. 3 (1895).



Perennial herb, with stems 0.04–0.15(–0.28) m long, decumbent or diffuse-ascending, rooting, with rather woody taproot, many-stemmed, ± caespitose, branched below inflorescence, pruinose to shortly whitish-pubescent on stems below inflorescence and on both surfaces of leaves or rarely wholly glabrous. *Stems* green, terete or rarely (2)4-lined; internodes usually exceeding leaves, eglandular. *Leaves* sessile or with petiole to 0.5 mm; lamina 2–15 × 2–10(–13) mm, ovate or oblong or elliptic to orbicular or oblanceolate, paler beneath, thinly chartaceous, not glaucous, shortly densely pubescent to pruinose or glabrous beneath, puberulous to glabrous above, plane or with margin recurved, spreading; apex rounded, margin entire, base rounded to rarely cuneate; venation: 2 pairs of laterals curved-ascending from lower 0.4 of midrib, tertiary reticulation dense, obscure, not prominent; laminar glands all pale or rarely 1–3 distal black, dense to rather sparse, unequal; intramarginal or submarginal glands black, irregular or rather sparse. *Inflorescence*

1–7(–21)-flowered from 1–2 nodes, sometimes with flowering branches from 1–2 lower nodes, cylindric to subcorymbiform, ± dense; pedicels 2–3 mm; bracts and bracteoles linear-lanceolate to linear-elliptic, black-glandular-ciliate, often with basal cilia somewhat longer but not auriculate. *Flowers* 8–12 mm in diam.; buds ellipsoid, rounded. *Sepals* 2.5–3.5 × 1–1.5 mm, equal, free or very shortly united, oblong or elliptic-oblong to oblanceolate, obtuse to rounded, with margin medium- to short-glandular-ciliate; veins 3, outer sometimes branched; laminar glands pale, punctiform and black, 2–12, scattered, ± punctiform; marginal glands black, flat-topped. *Petals* pale? yellow, not tinged red, 5–7(–8) × 2–2.5 mm, *c.* 2.5 × sepals, elliptic-oblong, rounded, apiculus absent; laminar glands pale, ± punctiform, few (or sometimes none?), and usually black, up to 9, punctiform, mostly distal; marginal glands absent. *Stamens c.* 25, longest 4–5.5 mm, 0.7–0.8 × petals; anther gland black. *Ovary* 1.5 × 0.8–1 mm, ellipsoid; styles 3–3.5 mm, *c.* 2 × ovary, spreading-incurved. *Capsule* 3–4 × 2.5–3 mm, ellipsoid to subglobose, exceeding sepals, enclosed when developing by petals twisting together. *Seeds* dark reddish brown, 0.4–0.6 mm long; testa finely foveolate-scalariform.

In rock fissures (gneiss or limestone) or near springs; (10–)500–1400 m.

Greece (Khíos, Ikaría, Karpathos, Kasos), Turkey (Izmir).

GREECE. Khíos: Amádhes to high up Pelinaíon, 8 July 1939 (fl), *Platt* 322 (K). Ikaría: Insula Ikaria, June 1933 (fl & fr), *Guiol* 2295 (BM, K); in summo jugo supra pagum Hag. Kyrikos, *c.* 950 m, 24–35 June 1932 (fl), *K.H. Rechinger* 2223 (BM, K, S, W). Karpathos: Finike, 10 m, 27 July 1950 (fr), *Davis* 18086 (K); M. Lastos, decl. occidentalis montis Kalolimni, *c.* 1100 m, 15 June 1935 (fl), *K.H. & F. Rechinger* 8196 (K); Elympo, 30 May 1883 (fl), *Barbey* 129 (K, Z). Kasos: *fide* Greuter, Pfleger & Raus in *Willdenowia* **13**: 58 (1983).

TURKEY. Izmir: Boz Dağ, c. 1400 m, 5 July 1968 (fl)), *Sorger* 68–16–5 (BM).

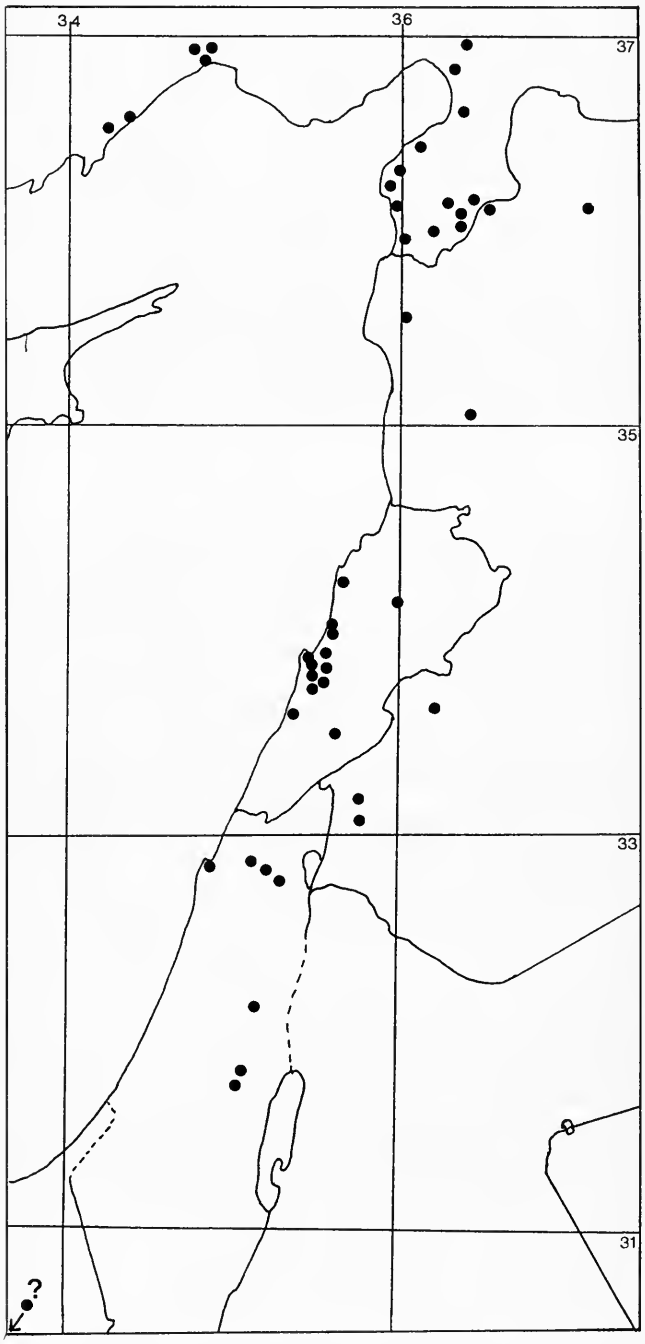
H. cuisinii is clearly a derivative of 21. *H. atomarium* growing in higher and more exposed habitats. Whilst *H. atomarium* normally has erect, non-rooting stems, in *Sintenis* 602 (Kaz Dağ) and *Stamatiadou* 9106 (Ikaría, 300–350 m) the stems are decumbent and, in the latter, rooting. There is, nevertheless, a distinct though small 'gap' between the respective flower sizes of the two taxa, and so I prefer to retain *H. cuisinii* at specific rank, at least until comparative field studies have been made.

The Karpathos population is the most reduced, with leaves small, often orbicular to oblanceolate and (along with the stems) sometimes glabrous. It shows a greater resemblance in leaf shape to the population of *H. atomarium* from adjacent Rhodos than to the rest of *H. cuisinii* and could conceivably have evolved independently – as indeed could the population on the Anatolian mainland (Boz Dağ), found at 1400 m near a spring.

23. **Hypericum lanuginosum** Lam., *Encycl.* **4**: 171 (1797); Willd., *Sp. pl.* **3**: 1466 (1802); Choisy, *Prodr. monogr. Hypéric.*: 52 (1821), in DC., *Prodr.* **1**: 551 (1824) (excl. loc. graec.); Spach in *Annls Sci. nat.* (Bot.) II, **5**: 357 (1836); Boiss., *Fl. orient.* **1**: 807 (1867); Holmboe in *Bergens Mus. Skr.* II, **1**(2): 127, f. 41 (1914); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Post, *Fl. Syria* 2nd ed. (ed. Dinsmore) **1**: 233 (1932); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 3 f. 35 (1932), **11**: 165 (1933), **12**: 85 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933); Rech. f. in *Arkiv f. Bot.* **5**: 292 (1960); Zohary, *Fl. Palaestina* **1**: 223, t. 329 (1966); N. Robson in *Notes R.B.G. Edinb.* **27**: 196 (1967), in P. Davis, *Fl. Turkey* **2**: 386 (1967), in Meikle, *Fl. Cyprus* **1**: 297 (1977); Mouterde, *Nouv. Fl. Liban Syrie* **2**: 527 (1970), t. 228 f. 2 (1986); Greuter, Burdet & Long, *Med-Checklist* **3**: 268 (1986); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 72 (1995). Type: Lebanon?, 'Levant', *?* in Herb. D. de Jussieu (P-holotype).

Maps 42, 43.

H. pestalozzae Boiss., *Diagn. pl. orient.* I, **8**: 113 (1849), *Fl. orient.* **1**: 808 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Stefanoff in *God. Agr. -les. Fak. Univ. Sofiya* **11**: 164 (1933), **12**: 85 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933). Type: Turkey, Antalya, in Pamphylia prope Adalia



Map 43 Sect. 27: 23. *H. lanuginosum* (part) ● (see also Map 42).

[Antalya], 1846 (fl), *Pestalozza* s.n. (G!-holotype, E!-photograph).

H. scabrellum Boiss., *Diagn. pl. orient.* II, **5**: 69 (1856), *Fl. orient.* **1**: 808 (1867); R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 26 (1933), **12**: 85 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933). Type: Turkey, Içel, ad fontes [origines] Cydni, 1500 m, 22 September 1853 (e. fr), *Kotschy* 330a (also 358m, 358n) (G!-holotype, E!- photograph; W!).

H. gracile Boiss., *Diagn. pl. orient.* II, **5**: 170 (1856). Type: Turkey, Içel, ad Gülek-Boghas, au nord de Tarsous, 19 August 1858, *Balansa* 370 (G!-syntype); Bouloukli, près de Mersina, 4 June 1855 (fl), *Balansa* 669 (G!-lectotype, selected here; BM!, E!, G-P!, K!-isolectotypes).

H. lanuginosum [var.] β *gracile* (Boiss.) Boiss., *Fl. orient.* **1**: 808 (1867), Suppl.: 129 (1888); Post, *Fl. Syria* 2nd ed. (ed. Dinsmore) **1**: 233 (1932).

H. lanuginosum subsp. *gracile* (Boiss.) [Holmboe in *Bergens Mus. Skr.* II, **1**(2): 129 (1914) in adnot., nom. provis. ex] J. Thiébaut, *Fl. Lib.-Syr.*: 140 (1936); Rech. f. in *Arkiv f. Bot.* **5**: 292 (1960).

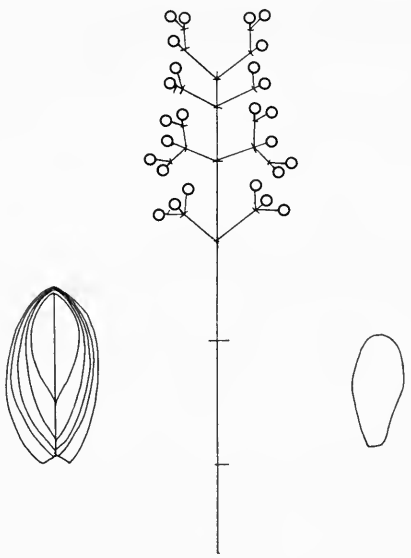
H. lanuginosum subsp. *millepunctatum* Holmboe in *Bergens Mus. Skr.* II, **1**(2): 129 (1914), excl. syn. *H. supinum* Vis. et spec. *Sintenis* 602: Lindb. f., *Iter Cypr.*: 23 (1946). Type: Cyprus, Kyrenia distr., Lapithos, 3–4 June 1905 (fl), *Holmboe* 836 (BG?-syntype); in monte supra Lapithos, 31 May 1880 (fl), *Sintenis & Rigo* 616 (W-lectotype; K!).

H. lanuginosum var. *scabrellum* (Boiss.) N. Robson in *Notes R.B.G., Edinb.* **27**: 196 (1967), in P. Davis, *Fl. Turkey* **2**: 386 (1967).

H. lanuginosum var. *pestalozzae* (Boiss.) N. Robson in *Notes R.B.G. Edinb.* **27**: 196 (1967), in P. Davis, *Fl. Turkey* **2**: 387 (1967).

H. atomarium sensu Osorio-Tafall & Seraphim, *List vasc. pls Cyprus*: 71 (1973).

Icones: Zohary, *Fl. Palestina* **1**: t. 329 (1966); Mouterde, *Nouv. Fl. Liban Syrie* **2**: t. 228 f. 2 (1986).



Perennial herb 0.12–0.8 m tall, erect to ascending or occasionally decumbent but not rooting at base, with ± woody rootstock, few-stemmed, unbranched below inflorescence, with stems shortly whitish-crisped-pubescent to puberulous below inflorescence or rarely glabrous, leaves densely whitish-pubescent to rarely scabrellous or subglabrous on both surfaces. *Stems* green, terete or uppermost internodes 2–4-lined; internodes exceeding to shorter than leaves, eglandular. *Leaves* sessile; lamina 15–60 × 5–25 mm, ovate to oblong or lanceolate, paler beneath, thinly chartaceous, not glaucous, densely shortly pubescent or velutinous to scabrellous beneath, more shortly so above, plane, spreading; apex obtuse or rarely subacute to rounded, margin entire, base cordate-amplexicaul to rounded or rarely broadly cuneate; venation: 2–4 pairs of laterals curved-ascending from lower 0.25–0.35 of midrib, tertiary reticulation rather dense, obscure, not prominent; laminar glands all pale or usually a few black scattered distally and towards margin, dense, unequal; intramarginal glands black, dense or rather irregular. *Inflorescence* 5- over 150-flowered from 1–8 nodes, sometimes with flowering branches from up to 3 lower nodes, cylindric to rounded-pyramidal; pedicels 2–4 mm: bracts and bracteoles elliptic to linear-lanceolate, black-glandular-ciliate and sometimes -auriculate. *Flowers* 15–20 mm in diam.; buds cylindric to ellipsoid, rounded. *Sepals* (3–)4–7 × (0.8–)1–3 mm, unequal to equal, free or shortly united, broadly to rather narrowly oblong or elliptic to subspathulate, obtuse (or rarely subacute) to rounded, with margin long-glandular-ciliate to glandular-denticulate or very rarely entire and eglandular; veins 5, outer ones commissural; laminar glands pale only, shortly striiform to punctiform; marginal glands black, flat-topped. *Petals* pale yellow, rarely red-veined, 7–12 × 3–5 mm, *c.* 2 × petals, elliptic to oblong, rounded, apiculus absent; laminar glands pale, ± elongate-punctiform, scattered, or absent, rarely also a few subapical laminar and/or marginal black gland dots. *Stamens* *c.* 30–55, longest *c.* 4–8 mm, *c.* 0.65 × petals; anther gland black. *Ovary* 1.5–3 × 1–1.5 mm, ellipsoid; styles 2.5–5 mm, 1.5–1.65 × ovary, spreading. *Capsule* 4–6 × 2–4 mm, broadly ellipsoid, enclosed when developing by petals twisting together. *Seeds* blackish red, 0.6 mm long; testa finely scalariform. 2n = 16 (n = 8, Reynaud, 1981), 32 (Reynaud, 1980).

Calcareous rocks and macchi, usually in shade or near moisture; 0–2400 m.

Turkey (southern Anatolia from Antalya to Hatay), western Syria, Lebanon, Israel (south to Bethlehem), Jordan (Gilead), Egypt (Sinai)?, Cyprus.

TURKEY. Antalya: 2 km westlich Antalya, 10–40 m, 27 May 1962 (fl), *Ehrendorfer* 62–1/45–28 (WU); Takhtali dağ (Kemer), near Kazdere, 1000 m, 15 August 1947 (fl), *Davis* 14210 (E, K). Konya: 60 km westlich Mut (Strasse Ermenek), *c.* 600 m, 7 June 1966 (fl), *Sorger* 66–30–4 (Herb. Sorger). Içel: Anamur, about the Anamorian, 8 May 1974 (fl), *Townsend* 74/62 (K); Gözne, 19 June 1971 (l. fl), *Ayano ğlu* H21 (BM). Seyhan: Karatepe, 200 m, 23 June 1971 (fl), *Sorger* 71–31–26 (BM, Herb. Sorger); Feke distr., Goksu gorge below Himmetli, 700–800 m, 9 July 1952 (e. fr), *Davis, Dodds & Çetik* D.19869 (BM, E, K). Hatay: Antakya, near St Peter's Church, 150–300 m, 27 April 1957 (fl), *Davis & Hedge* D.27252 (BM, K); Ilica to Arsuz, Amanos dağlari, *c.* 500 m, 9 June 1967 (fl), *Akman* 72 (ANK, BM).

SYRIA. North: in vicinitate oppidum Antakieh, in rup. calc. montis Silpius, 24 May 1933 (e. fr), *Samuelsson* 5328 (K); Monts Nussairy, Aïn Halakim, 750–900 m, June 1910 (fl), *Haradjian* 3454 (K). South: Leontes [Nahr el Litani] valley, 1863–1864 (fr), *Lowne* s.n. (K); Duma, 30 June 1865 (fr), *G.E. Post* s.n. (K).

LEBANON. Coast: Nahr el Kelb, 15 May 1943 (fl), *Davis* 6079 (BM, K); Beirut, May 1886 (fl), *Post* s.n. (UPS); près de Saide, 24 May 1853 (fr), *Blanche* 59 (JE, K). Lower mountains: near Ain Zehalta, 1000 m, 26 May 1977 (fl), *Ball* 2191 (K); Kalaleh, infra pag. Aley, *c.* 600 m, 1 June 1932 (fl), *Samuelsson* 1952 (K); Bhamdûn, 1200–1300 m, 10 June 1910 (fl), *Bornmüller* 11525 (BM). Medium mountains: Bscherre [Bcharre], ad fontes Mars Tserkis, 1350 m, 19 July 1855 (fr), *Kotschy* 263 (BM, K, UPS).

ISRAEL. Galilee: Mt Carmel, Wadi Shomrya, 9 April 1942 (fl), *Davis* 4398 (BM, K); west of Cana, 16 May 1911 (fl), *Meyer* 4782 (K). Samaria: Nablus, Mt Garazim [Gerizim], 23 April 1942 (fl), *Davis* 4455 (K). Judaea: Bethlehem, 1820 (fr), *Gerhard* s.n. (JE); in Hierosolyma [Jerusalem], pre-1861 (fl), *Roth* s.n. (K).

JORDAN. Gilead: Rami to Bugeia, 7 June 1942 (fr), *Davis* 4809 (BM, K); Wadi Qairua, 1942? (fl), *Davis* 4830 (BM) – not in Map 43.

EGYPT. Sinai: Sinai, 1837 (fl), *Aucher* 868 (G), 869 (K). This species has not been recorded from Sinai since 1837 and can be presumed to be extinct there now.

CYPRUS. Kyrenia distr., Lapithos, 13 June 1969 (e. fr), *Lindberg* s.n. (H, K); Kykko mts, Roudkias, 24 June 1968 (fl), *Economides* ARI 1239 (K).

H. lanuginosum is rather variable, and two extreme reduced forms with stems glabrous or almost so were recognised as 'rather indefinite varieties' in *Flora of Turkey* (Robson, 1967*b*). Var. *scabrellum*, with stems weak and decumbent, leaves scabrellous to glabrous and sepals glandular-ciliate, occurs mostly at higher altitudes throughout the Turkish range of the species; but there are many intermediate forms, and this is probably not a homogeneous taxon but merely the result of high altitude and/or exposure. Specimens of this 'variety' include:

Antalya: Calbali dağ near Fesliken yayla, 1800 m, 14 July 1949 (fl), *Davis* 15349 (E, K). Burdur: Burdur to Antalya, 8 km from Bucak, 720 m, 11 June 1962 (fl), *Dudley* D.35689 (K). Içel: Bulgar [Bolkar] dağ, source of Cydnus [Pamuk], 1500 m, 22 September 1853 (e. fr), *Kotschy* 330a (G, W). Seyhan: mts N. of Haruniye, ravine of Çattak Suyu, 330 m, 13 June 1953 (e. fr), *Huber-Morath* 12089 (G).

The other extreme glabrous-stemmed form, var. *pestalozzae*, with leaves pubescent to puberulous and sepal margin entire and eglandular, is endemic to a small area south-west of Antalya; but here too there are intermediates, notably just east of Antalya at Konya Alti. Specimens of this 'variety' include:

Antalya: Kemer distr., 0–100 m, 7 July 1949 (fr), *Davis* 15020 (E, K); Kara dağ, 200 m, 23 June 1958 (e. fr), *Little* 111 (E, K). Intermediates include: Antalya: Atbükü Bay, 5 km N. of Çirali, 26 May 1950 (fl), *Huber-Morath* 9540 (BASBG); Konya Alti, 10 m, 17 May 1936 (fl), *Tengwall* 610 (K, S).

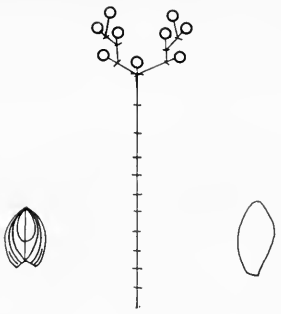
In view of the intermediates between both these extreme forms and typical *H. lanuginosum*, it is logically impossible to recognize them taxonomically.

24. **Hypericum decaisneanum** Coss. & Daveau in *Bull. Soc. bot. Fr.* **36**: 104 (1889); E. Durand & Barratte, *Fl. libic. Prodr.*: 48 (1910); Keith, *Prelim. Check List Lib. Fl.*: 567 (1973); Ali in Ali & Jafri, *Fl. Libya*, Guttiferae: 8 (1976); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986). Types: Libya, Cyrenaica, in montibus apricis Cyrenaicis ad Dernah, 15 July 1875, *Daveau* s.n. (P-syntype); ad Oued Dernah, 5 May 1877 (fl), *Taubert* s.n. (P-lectotype, selected here; BM!, G, K!, Z!-isolectotypes). The BM and K specimens are labelled '*Taubert* in *Barbey* 582', the others have no number.

Map 40

H. taubertii Asch. & Barbey ex Coss. in *Bull. Soc. bot. Fr.* **36**: 104 (1889) pro syn. ['*tauberti*']; R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 179 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **11**: 163 (1933), **12**: 84 (1934), in *Pflanzenareale* **4**(1): Karte 4a (1933). 'Type' as for *H. decaisneanum* Coss. & Daveau.

Perennial herb with stems 0.04–0.15 m tall, erect to suberect, sometimes from decumbent and rooting base, with woody taproot, many-stemmed, unbranched below inflorescence, whitish- to greyish-pubescent except inflorescence. *Stems* green above, ± reddish below, all terete or inflorescence branches 2-lined; internodes all shorter than the crowded leaves except in inflorescence and sometimes towards base, eglandular. *Leaves* sessile; lamina 6–12 × 3.5–10 mm, ovate, concolorous, rather thickly chartaceous, not



glaucous, shortly pubescent above, more densely and sometimes ± crisped-pubescent beneath, with margin recurved to revolute, apex ± depressed-concave and veins impressed, spreading to deflexed; apex subacute to rounded, margin entire, base broadly cuneate to cordate-amplexicaul; venation: 3–4 pairs of laterals curved-ascending from lower 0.25–0.5 of midrib, tertiary reticulation obscure; laminar glands pale, dense, subequal and occasionally a few black; intramarginal glands black, rather dense, regular. *Inflorescence* 3–*c.* 20-flowered, from 1–4 nodes, without lower flowering branches, narrowly pyramidal to subcorymbiform, all or individual parts dense; pedicels 1–1.5 mm; bracts and bracteoles oblong to triangular-lanceolate, black-glandular-ciliate, densely glandular-auriculate. *Flowers c.* 12–15 mm in diam.; buds ovoid, subacute. *Sepals* 2.6–4.5 × 1 mm, subequal, shortly united, narrowly oblong to broadly elliptic, rounded, with margin rather long- to short-glandular-ciliate or -subdenticulate; veins 5, unbranched?; laminar glands pale, linear to punctiform, occasionally with up to 6 black dots distally; marginal glands black, flat-topped. *Petals* bright yellow, veined red, 6–8 × 2.5–3 mm, *c.* 2.5 × sepals, oblong, rounded, apiculus absent; laminar glands pale and/or black, scattered, punctiform; marginal glands black, few sessile. *Stamens c.* 40, longest 5–7 mm, 0.8–0.9 × petals; anther gland black. *Ovary c.* 1.5–2.5 × 0.8–1.3 mm, narrowly ovoid-pyramidal; styles *c.* 3.5–6 mm, *c.* 2.4 × ovary, spreading-incurved. *Capsule* 4–5 × *c.* 2.5–3 mm, ovoid, equalling or exceeding sepals, enclosed when developing by petals twisting together. *Seeds* not seen.

Crevices of limestone rock; 20–700 m.

Libya (Cyrenaica – east end of Jebel el Akhdar).

LIBYA. Cyrenaica: Wadi Derna, 8 April 1939 (o. fr), *Simpson* 39457a (BM) = *Sandwith* 2481 (K); Derna, 26 June 1912 (fl & fr), *Vaccari* 618 (BM, FI*); El Gubba, 13 May 1934 (bud), *Pampanini & Pichi-Sermolli* N.4971 (FI*, K); Wadi Shira, above falls, 600 m, 18 May 1958 (fl), *Park* 525 (K); near El Minier, 450 m, 11 April 1939 (st), *Simpson* 39457b (BM).

H. decaisneanum, with its densely hairy leaves and black-gland-dotted petals, resembles a dwarf version of 18c. *H. annulatum* subsp. *afromontanum*, to which it is probably most closely related. It bridges the gap in distribution between the European and African subspecies of *H. annulatum* but is much smaller than either. According to Gimingham & Walton (1954), it is confined to the lower slopes (152–238 m) of the main north-facing escarpment slope of Jebel el Akhdar as part of a well-developed chasmophytic community.

Sect. 28. **ELODES** (Adans.) W. Koch, *Syn. Fl. Germ. Helv.* 2nd ed. **1**: 148 (1843).

Perennial herb with stems up to 0.4 m or longer, with simple hairs, with dark (reddish) glands on sepals only; branching below inflorescence lateral. *Stems* terete, eglandular; cortex not exfoliating; bark absent. *Leaves* opposite, decussate, sessile, free, persistent; lamina entire, with venation subpalmate to palmate, closed except for lowermost veins, with tertiary venation densely reticulate; laminar

glands punctiform; marginal gland dots dense; ventral glands absent. *Inflorescence* 1–13-flowered, with branching dichasial (first node) then monochasial, from one node, without lower flowering branches; bracts and bracteoles reduced, transitional in form to sepals. *Flowers* pseudo-tubular, homostylous. *Sepals* 5, *c.* 0.3–0.5 united, persistent, erect in flower and fruit, with margin glandular-ciliate; veins 3(5); laminar glands pale, linear; marginal glands reddish, flat-topped. *Petals* 5, persistent and twisting together round developing capsule, without apiculus; marginal and laminar glands absent. *Stamen fascicles* 5, united 2+2+1 (i.e. '3'), persistent, totalling 12–13 stamens; filaments 0.6–0.7 united; anthers yellow, gland amber; pollen type IX; lodicules 3, scale-like, alternating with stamen fascicles. *Ovary* with 3 parietal placentae, each ∞-ovulate; styles 3, free, with bases discrete; stigmas narrowly capitate. *Capsule* 3-valved, chartaceous, with valves narrowly longitudinally vittate. *Seeds* narrowly cylindric to ellipsoid-cylindric, not carinate, without apical expansion; testa ribbed-scalariform.

BASIC CHROMOSOME NUMBERS (X). 10 and/or 8; ploidy 2 and possibly 4. My count (n = 16; Robson, 1968), for which the slide preparation used has deteriorated and cannot now be checked, and that of Al-Bermani et al. (1993) – 2n = 16, i.e. n = 8, fit better with the morphology of *H. elodes*, which is specialized in relation to *H. coadunatum* (n = 9) in all respects. On the other hand, Delay's count (n = 10; Delay, 1972) is supported by a photograph and would imply that *H. elodes* is sister species to the whole *H. caprifolium* group (Spp. 13–15; n = 9–8). Only further counts will reveal which is correct.

HABITAT. Wet soil, mesotrophic mires, along streams and in ponds on acid soil, sometimes in deeper water; sea level to *c.* 700 m (Spain, Azores).

DISTRIBUTION. British Isles; continental Europe from France, Spain and Portugal eastward to NW Germany (and scattered localities further east), Austria ? and NW Italy; Azores.

One species.

1. **Hypericum elodes** L., *Amoen. Acad.* **4**: 105 (1759), *Sp. pl.* 2nd ed.: 1106 (1762); Hudson, *Fl. angl.*: 292 (1762); Choisy, *Prodr. monogr. Hypéric.*: 52 (1821), in DC., *Prodr.* **1**: 551 (1824); Syme, *Engl. Bot.* 3rd ed.: 159, t. 276 (1863); H. Watson in Godman, *Nat. Hist. Azores*: 143 (1870); Trelease in *Rep. Mo. bot. Gdn* **8**: 100 (1897); Ohlendorf, *Beitr. Anat. Biol. Fruchte u. Samen einheim. Wasser- u. Sumpfpflanzen*: 59 (1907) [Diss. Erlangen U.]; R. Keller in Engl. & Prantl, *Nat. Pflanzenfam.* 2nd ed. **21**: 175 (1925); Hegi, *Ill. Fl. Mittel-Europa* **5**(1): 509, ff. 1997–8 (1925); Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* **10**: 58, t. 1 f. 1, t. 2 f. 1, t. 3 f. 1 (1932), **11**: 139 (1933), **12**: 81 (1934), in *Pflanzenareale* **4**(1): Karte 1a (1933); Mansfeld in *Repert. Sp. nov.* **47**: 278 (1939); Guinea, *Viscaya Paisaje veg.*: 215 & maps (1949); Ross-Craig, *Drawings Br. Pls* **6**: t. 16 (1952); Font Quer in *Geogr. Univ. de Vidal de la Blache* **10**: 207, f. 75 (1953); Corti in *Webbia* **11**: 847 (1956); Janchen in Höfler & Knoll, *Cat. Fl. Austr.* **1**(2): 257 (1957) ['*helodes*']; Pinto da Silva & Rainha in *Agronomia lusit.* **20**: 236 (1959); Palinha, *Cat. Pl. Vasc. Açores*: 75 (1966); Bournerias in *Bull. Ass. Nat. Vall. Loing* **43**: 86 (1967); N. Robson in Tutin et al., *Fl. Europaea* **2**: 266 (1968); Fournier, *Quatre flores France* 2nd ed.: 456 (1977, repr. 1990) ['*helodes*']; van Rompaey & Delvosalle, *Atlas Fl. Belg. Lux.* Comment.: 66 (1978), Atlas, 2nd ed.: t. 418 (1979); Bonafé Barceló, *Fl. Mallorca* **3**: 178 (1979); Pignatti, *Fl. Italia* **1**: 347 (1982); Ramos in *Trab. Dep. Bot. Univ. Complut.* **12**: 54, t. 6 f. 5 (1983); I. Hagemann in *Flora* **173**: 130, ff. 35, 38 (1983); Reynaud in *Adansonia*, no. 1: 88, t. 2 ff. 3, 4 (1985); N. Robson in *Wild Fl. Mag.* no. 403: 17 (1985); Mennema, Quené-Brot. & Plate, *Atlas Nederl. Fl.* **2**: 176 (1985); Greuter, Burdet & Long, *Med-Checklist* **3**: 265 (1986); Clapham, Tutin & Moore, *Fl. Br. Isles* 3rd ed.: 116 (1987); Ramos in Valdés, Talavera & Galiano, *Fl. Vasc. Andal. Occ.* **1**: 318 & f. & map (1987); Haeupler & Schonf., *Atlas Farn- u. Blütenpfl. Bundesrep. Deutschl.*: 330, Karte 963 (1988); Kaplan, Grenzheuser & Lenski in *Tuexenia* N.S. No. 9: 49 (1989); Perring & Walters, *Atlas Br. Fl.* repr. amend.: 60 (1990); Stace, *New Fl. Br. Isles*: 257 (1991); Ramos in Castroviejo et al., *Fl. iberica* **3**: 185 (1993); N. Robson in Cullen et al., *Eur. Gdn Fl.* **4**: 73 (1995). Type: Ray, *Syn. Meth. Stirp. Brit.* 3rd ed., ed. Dillenius: 344 (1724): 'Western Parts of England; especially towards the Land's End in Cornwal'. Herb. Sloane **124**: 9 (Herb. Buddle.) (BM-SL!) is selected here as the neotype. It has no direct connection with Dillenius, but Dillenius studied the Buddle collection when working on the 3rd edition of Ray's *Synopsis*. The specimen is annotated with references to Ray's *Historia plantarum* (1686–1688) and Petiver, *Herb. Brit.*: t. 60 f. 10 (1764).

Fig. 27D, Map 36.

H. palustre Salisb., *Prodr. stirp. horto Chapel Allerton*: 369 (1796), nom. illegit. Type as for *H. elodes* L.

Elodea palustris J. St. Hil., *Exp. Fam. nat.* **2**: 24 (1805). Type as for *H. elodes* L.

Elodes palustris Spach in *Ann. Sci. nat.* (Bot.) II, **5**: 172 (1836), *Hist. nat. vég.* Phan. **5**: 369 (1836); Rchb., *Ic. fl. germ.* helv. **6**: t. 342 (1844); Willk. & Lange, *Prodr. fl. hispan.* **3**: 596 (1878); Glück, *Biol. morph. Untersuch. Wasser- u. Sumpfgewächse* **3**: 38 (1911), nom. illegit. Type as for *H. elodes* L.

Hypericum tomentosum sensu Durand in Steud., *Nomencl. bot.* 2nd ed. **1**: 790 (1840), nom. synon.

H. helodes St.-Lager in *Ann. Soc. bot. Lyon* **7**: 128 (1880) et auct. plur., orth. mut.

H. helodeum St.-Lager in *Ann. Soc. bot. Lyon* **7**: 128 (1880), orth. mut.

Helodes glandulosum St.-Lager, *Nomencl. bot.*: 37 (1881); Morot in *J. de Bot.* **8**: 84 (1894); Bubani, *Fl. Pyren.* **3**: 352 (1901) ['*glandulosa*'], nom. illegit. Type as for *Hypericum elodes* L.

Tripentas helodes (L.) Asch. & Graebn., *Fl. Nordostdeutschen Flachl.*: 493 (1899), comb. illegit. (Art 63.1).

Elodes palustris forma *submersa* Glück, *Biol. morph. Untersuch. Wasser- u. Sumpfgewächse* **3**: 39 (1911). Type: No specimen made?

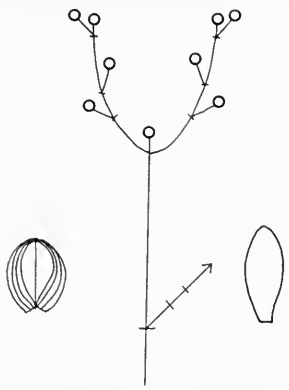
Hypericum elodes forma *glabratum* Druce in *Rep. Bot. Exch. Cl.* **7**: 435 (1924). Types: England, Hampshire (south), Lyndhurst, 1924, *Druce* s.n. (OXF-syntype); Buckinghamshire, Burnham Beeches, 1922, *Druce* s.n. (OXF-lectotype, selected here).

Spachelodes elodes (L.) Y. Kimura in *J. jap. Bot.* **11**: 832 (1935), in Nakai & Honda, *Nova fl. jap.* **10**: 19 (1951).

Hypericum helodes forma *terrestre* Glück in Panscher, *Süsswasser-Flora Mitteleuropas* **15**: 297 (1936). Type: No specimen made?

Icones: Syme, *Eng. Bot.* 3rd ed.: t. 276 (1863); Ross-Craig, *Drawings Br. Pls* **6**: t. 16 (1952);

Perennial herb with herbaceous rootstock emitting erect (wholly submerged) to prostrate and rooting (terrestrial) stems up to 0.4(–0.7) m, the terrestrial or shallow-water shoots bearing erect to ascending, terminal and axillary flowering shoots 0.05–0.2 m tall, the whole emergent plant up to sepals (dorsal) crisped-pubescent to tomentose or inflorescence puberulous, submerged parts shortly and finely villous to glabrous. *Stems* green to reddish, terete, 1 mm thick and threadlike (submerged) to 6 mm thick with swollen spongy



internodes (shallow water or terrestrial); internodes up to 50(–80) mm long and 5 × as long as leaves (deep water) to shorter than leaves (terrestrial). *Leaves* sessile; lamina 5–30 × 2–22 mm, oblong-elliptic (deep water) to broadly elliptic or broadly ovate or orbicular, concolorous, not glaucous, plane, spreading; apex rounded, base cuneate (deep water) to cordate-amplexicaul; venation: 2–3 pairs of laterals curved-ascending from base or near base of midrib; tertiary reticulation dense, plane; laminar glands pale, dense, scattered, small; intramarginal glands pale, dense. *Inflorescence* 1–13-flowered from one node, terminal but usually apparently axillary when only one of uppermost pair of axillary shoots develops, laxly subcorymbiform to narrowly pyramidal, without lower flowering branches; pedicels 3–7 mm (–11 mm in fruit); bracts not auriculate; bracteoles triangular, obtuse, red-glandular-ciliate. *Flowers* 7–15 mm in diam., infundibular to subrotate, pseudo-tubular; buds cylindric to narrowly ovoid, subacute. *Sepals* 2.5–3.5 × 1–2 mm, subequal, *c.* 0.3–0.5 united, ovate or triangular-ovate to narrowly oblong, rounded, with margin glandular-ciliate; veins 3(5), branched or not; laminar glands pale, linear; marginal glands red, on short cilia. *Petals* lemon yellow, not tinged red, 8–10 × 2.7–3 mm, *c.* 3 × sepals, oblong-oblanceolate, subtruncate, without apiculus, in lower 0.25 with adnate ligulate appendage, apex free, trifid; laminar and marginal glands absent. *Stamens* 12–13, clearly 3-fascicled, with filaments c. 0.65 connate with line of hairs below free parts, longest *c.* 5–6.5 mm, *c.* 0.6 × petals; anther gland amber; lodicules 3, squamiform, 0.5 × 0.25 mm, elliptic, retuse. *Ovary* 1-locular, *c.* 2.5–2.7 × 1–1.5 mm, narrowly ovoid; styles 3, 2–2.5 mm, just shorter than ovary, ± narrowly outcurving. *Capsule* 4–5 × 2.5–3 mm, ovoid to cylindric, exceeding sepals. *Seeds* dark yellow-brown, 0.6–0.8 mm long; testa ribbed-scalariform (cf. Reynaud, 1985: 91, t. 2 ff. 3, 4). 2n = 16 (n = 8) (Al-Bermani et al., 1993), 20 (n = 10) (Delay, 1972), 32 (n = 16) (Robson, 1968); see sectional description.

In mesotrophic mires and pond or stream margins, usually in shallow water but sometimes in wet soil or deep water (to *c.* 50 cm); to 800 m in Spain and 770 m in the Azores, lowland elsewhere in Europe.

Portugal (W. & N.), Gibraltar, Spain (N. & central), Balearic Is. (extinct?), France (except SE), Belgium, Holland, England (except NE), Wales, Scotland (SW and western islands), Ireland (except centre); Azores. Unlocalized specimens in Herb. Schousboe are likely to come from Iberia rather than Morocco (Jahand. & Maire, *Cat. Pls Maroc* **3**:484, 1934).

PORTUGAL. Porto: near Oporto, 2 July 1887 (fl), *Murray* s.n. (BM). Viseu: Santa Comba Dão, Pego, 15 June 1954 (fl), *J. & A. Matos & Marques* 4996 (BM, COI*). Coimbra: Montemar-o-Velho, Matas de Foja, 8 August 1950 (fl & fr), *J. & A. Matos* s.n. (BM, COI*). Leiria: Nazaré, margens da Lagôa de Gataias, 25 July 1952 (fl & fr), *A. & R. Fernandes & Sousa* 4223 (BM, COI*). Santarem: prope Salvaterra dos Magos, July 1890 (fl & fr), *Daveau* in *Monteiro* Fl. lus. exsicc. 4252 (BM). Setúbal, Lagôa de Albufeira, 20 July 1941 (fr), *Pedro* 40 (K, LISJC*).

SPAIN. La Coruña: Puente Carreira to Ayazo, 9 August 1968 (fl), *Bellot* s.n. (W). Pontevedra: peninsula El Grove, 7 July 1930 (fl), *Buch* s.n. (H). Lugo: Begonte, 5 August 1964 (fl), *Bellot & Casaseca* s.n. (M*, RNG). Viscaya: Urquiola, 27 August 1946 (fr), *Guinea* 634/575 (RNG, SEV*). Alava: entre Ochandiano et Villareal, 700 m, July 1935 (fl), *Losa* in *Sennen* 9894 (BM). ? : Aragon, au pied de la montagne de Castanède, 800 m, July 1864 (fl), *du Parquet* s.n. (BM). Salamanca: between Salamanca and Ciudad Rodrigo, 30 June 1928 (fl), *Lacaita* 532/28 (BM). Toledo: Montes de Toledo, Montes de Mora, 18 June 1959 (fl), *Sandwith* 5579 (K). Huelva: Almonte, Marismas de El Rocio, Laguna del Acebrón, 23 June 1981 (fl), *Demisse, Silvestre & Valdés* 54 (RNG).

BALEARIC ISLANDS. Mallorca, Arta, not seen since 1908 (*fide* Bonafé Barceló, 1979: 179).

FRANCE. Finisterre: Ushant, 11 August 1933 (fl & fr), *Meinertzhagen* s.n. (BM). Manche: Cherbourg, 30 July 1887 (fl), *Corbière* s.n. (BM). Calvados: Vire, October 1837 (fr), *Lenormand* 20 (K). Seine-et-Marne: Forêt de Fontainebleau, Belle Croix, 19 August 1877 (fl & fr), *Moreau* s.n. (H). Yvelines: Forêt de Rambouillet, aux environs de Poigny-la-Forêt, 14 July 1971 (fl), *Retz* 64560 (BM, H). Sarthe: Sille le Guillaume, June 1871 (fl), *Harriot* s.n. (K). Loire Inférieure: Nozay, August-September 1929 (fr), *Becquet* in *Exsicc. Duffour 1929* 801 (BM). Vendée: La Châtaigneraie, 25 July 1948 (fl), *Charrier* 255 (BR*, K). Loir-et-Cher: Chambord près Blois, 1872 (fr), *Mouin* s.n. (H). Cher: Achères, 27 July 1908 (fl), *Imbault* s.n. (FR). Vosges: Crémanvillers près Vagney, August 1869 (fr), *Pierrat* s.n. (BM, K). Haute Saône: St Germain, 28 August 1871 (fl), *Vendrely* s.n. (FR). Côte d' Or: Saulieu, 27 July 1872 (fl & fr), *Bonnet* s.n. (K). Vienne: Montmorillon, 19 July 1891 (fl), *Violleau* 669 (H). Cantal: aux environs de Quatre Chemins, 23 August 1869 (fl), *Héribault-Joseph* s.n. (BM). Aveyron: canton de Rignac, montagne de Buène, 26 July 1868 (fl), *de Valon* in *Billet* 2644 (BM). Gironde: Biscarosse, E. of village on D652, 70 m, 8 July 1980 (fl), *M. & S. Gardner* 665 (BM). Landes: Dax, tourbière de Narosse, 23 July 1880 (fl), *Bonnet* s.n. (K). Basses Pyrenées: Biarritz, tourbière de Brindosse, 20 July 1880 (fl), *Bonnet* s.n. (K). Hauts Pyrenées: Lac de Lourdes, June 1870 (fl), *Bordère* s.n. (K). Pyrenées Orientales: prope Biandos, September 1820 (fl & fr), *Bentham* s.n. (K).

ITALY. Liguria: in western Riviera (Gismondi, 1950: 336) but now extinct (Corti, Manzi & Pedrotti, 1992). Toscano: in the Selva Pisana at San Rossore (Corti, 1953; Pignatti, 1982: 347; Corti, Manzi & Pedrotti, 1992).

AUSTRIA. Oberösterreich (Muhlkreis): Neuhaus a. d. Donau and Unter-Weissenbach, perhaps extinct (Janchen, 1957: 257).

GERMANY. Bavaria: Lohrtal westlich Heigenbrücken (Spessart), 6 October 1923 (fr), *Oberneder* 3268 (BM). Hessen: Grossherz Hessen, bei Obermossau im Odenwald, 9 July 1884 (fl), *Dürer* s.n. (FR). Nordrhein-Westfalen: Tecklenburg, August 1878 (fl), *Wilmigen*? s.n. (K); Gangelt (nördlich von Aachen), 28 August 1866 (fl & fr), *Becker* in *Wirtgen*, Pl. sel. fl. Rhen. IV 175 (BM). Neidersachsen: bei Celle, August 1878 (fl), *Noë* s.n. (H); Oldenburg, Westerslade, June 1902 (fl & e. fr), *Schütte* s.n. (H). Sachsen-Anhalt: bei Hoyerswerda, August 1908 (fl & e. fr), *Missbach* s.n. (BM, H).

NETHERLANDS. Noord-Brabant: Oisterwijk, N. bank of Achterste Choorven, 6 August 1953 (fr), *Koster* 4048 (K, L). Utrecht: between Maarn and Maarsbergen, 16 June 1952 (fl), *Kramer, Mennega & Stafleu* s.n. (H).

BELGIUM. Limburg: Genek, July 1874 (l. fl), *de Dieudonné* s.n. (FR, K). Brabant: Aerschot [Aarschot], August 1862 (fl), *Devos* in *Van Heurck* Pls rare crit. Belg. I 11 (BM, K). Antwerpen: Rijckevorsel-Canal, 12 August 1920 (fr), *Vermaesen* s.n. (BR*, K). Namur: Canton de Gedinne, Rienne, 14 July 1861 (fl), 7 October 1861 (fr), *Gravet* in *Req. Maill.* 843 (BM, K).

CHANNEL ISLES. Jersey: St Ouen's Pond, 11 July 1896 (fl & fr), *Lester-Garland* s.n. (K). Guernsey: Grand Mare, 31 July 1914 (fl), *Barton* s.n. (BM).

ENGLAND. Scilly Isles: St Mary's, Tremelethen (Lousley, 1971: 128). Cornwall: Zennor, above Pendour Castle, 2 August 1947 (fl), *Taylor* 1100 (K). Devon: Dartmoor above Widecombe, 9 September 1932 (e. fr), *Bullard* 14 (K). Dorset: near Wareham, 5 September 1957 (fl), *Wycherley* 222 (BM). Hampshire: New Forest, Brockenhurst, 15 July 1962 (fl), *Whitefoord* s.n. (BM). Sussex: Ashdown Forest, W. of Press Ridge Warren, 135 m, 8 August 1931 (fl), *Summerhayes & Milne-Redhead* 758 (K). Kent: Chislehurst Common, 6 August 1904 (fl), *Lowne* 284 (K). Surrey: Ockham Common, Boulder

Mere, 24 June 1961 (fl), *Raven & Cannon* 16165 (BM). Essex: Epping Forest, August 1883 (fl), *Paulson* s.n. (BM). Berkshire: Mortimer Common, 28 July 1946, *Townsend* s.n. (K). Suffolk: †[13]near Lowestoft, 1854 (fl & fr), *Powis* s.n. (BM). Norfolk: near North Walsham, August 1928 (fl & fr), *Meinertzhagen* s.n. (BM). Cambridgeshire: †Gamlingay, 24 August 1824 (fl), *W.J. Hooker* s.n. (K). Bedfordshire: Luton, 30 July 1951 (fl & e. fr), *Dony* s.n. (K). Gloucestershire: Ruspidge, Foxes Bridge, 20 August 1951 (fl), *Townsend* s.n. (K). Worcestershire: Abberley Hills, 10 June 1840 (fl), *Newman* s.n. (BM). Shropshire: Shomere, 26 July 1850 (fl), *Bentham* s.n. (K). Lincolnshire: Sawcliffe, 1857 (fr), *Fowler* s.n. (BM). Derbyshire: Tansley, August 1850 (fl), *Whittaker* s.n. (BM, K). Cheshire: Oakmere, 8 July 1868 (fl), *Bickham* s.n. (BM). Lancashire: †Halsall, 4 August 1883 (fl), *Brown* s.n. (LIV); †Morecambe Bay, August 1852 (fl), *Lord* s.n. (LIV). Yorkshire: Skipwith Common, August 1933 (fl & fr), *Riddelsdell* s.n. (BM); †Pilmoor, 1904 (fl & fr), *Simpson* s.n. (BM); †Nawcliffe, 15 m, 1876 (fl), *Weal* s.n. (BM). Northumberland: †Bickwell Bog, August 1855 (fl), *Carruthers* s.n. (BM). Westmorland: Staveley, *c.* 120 m, 28 July 1937 (bud), *Martindale* 99 (H, K). Cumberland: †Dent Hill, 13 July 1868 (fl), *Addison* s.n. (BM).

WALES. Glamorgan: Swansea, Mayals, 25 September 1909 (fr), *Riddelsdell* 289 (BM). Radnorshire: R. Wye *c.* 4.8 km NW of Rhyader, 11 August 1954 (fl), *Sandwith* 4155 (K). Pembrokeshire: St David's, August 1882 (fr), *Ridley* s.n. (BM). Cardiganshire: Llanbadarn to Trefeglwys, 16 August 1899 (fl & fr), *Marshall* s.n. (BM). Montgomeryshire: Dovey Junction, 13 August 1923 (fl), *Barton* s.n. (BM). Merioneth: Harlech, August 1954 (fl), *Boyd* in *Holder* 3224 (LIV). Caernarvon: Pwllheli, Llanbedrog, 6 July 1949 (fl), *Dyson* s.n. (BM). Denbighshire: near Llanrust, 9 August 1930 (fl), *Holder* 470 (LIV). Anglesey: Holyhead I., 24 July 1853 (fl), *Anon.* (LIV).

ISLE OF MAN. Andreas, Gat-y-whing, June 1925 (bud), *Paton* s.n. (BM).

SCOTLAND. Kirkcudbright: Palnure, Bruntis Loch, 15 August 1940 (fl), *Mackechnie* s.n. (K). Wigtonshire: near Port Logan, [18—] (fl), *Balfour* s.n. (K). Ayrshire: †near Ayr, n.d. (fl), *Maclagan* s.n. (BM). Stirlingshire: †Denny Bog, 2 August 1936 (fl), *Harrison* s.n. (LIV). Buteshire: Isle of Arran, near Lochranza, 25 August 1900 (l. fl), *Marshall* s.n. (BM). Argyllshire: Isle of Gigha, 1898 (fr), *Somerville* s.n. (BM); Isle of Islay, east side, 5 September 1883 (fl), *Ley* s.n. (BM); Isle of Mull, Ross of Mull, Camas Tuath, 7 July 1968 (fl), *BM Mull Survey* 2904 (BM). Invernessshire: Isle of Canna, August 1897 (fr), *Macvicar* s.n. (BM). Outer Hebrides: Harris, W. coast, 8–15 August 1959, *fide* Perring in *Proc. B.S.B.I.* **4**: 206 (1961); N. Uist, Newton, November 1936 (o. fr), *Campbell* s.n. (BM); S. Uist, 1936 (e. fr), *Comber* s.n. (BM); Barra, 5 July 1887 (fl), *Somerville* s.n. (BM); Vatersay, near sea, 17 August 1983 (fl & fr), *J. & M. Cannon & Chorley* 2 (BM).

IRELAND. Kerry: near Lough Guitane, *c.* 90 m, 5 September 1935 (fl & fr), *Ross-Craig, Burtt & Sealy* 374 (K); Caragh, 4 July 1970 (fl), *Greenwood* s.n. (LIV). Cork: near Glengariff, August 1935 (fl & fr), *Ross* s.n. (BM). Waterford: Carrickovantry, *c.* 3.2 km W. of Tramore, 27 August 1967 (fl), *Ferguson* 2070 (BM). Tipperary: †Clogheen, Castlegraco, August 1850 (fl), *Carroll* s.n. (BM). Galway: Connemara, Rounstone, August 1884 (fl), *Green* s.n. (LIV). Wicklow: Croghan Mt., July 1882 (fl), *Fawcett* s.n. (BM). Louth: †Carlingford, 22 August 1895 (fl), *Last* s.n. (K). Donegal: †Kilmacrenan, August 1886 (fl), *Kinshan* s.n. (BM). Down: †Newtonards, August 1871 (fl), *Linton* s.n. (BM).

AZORES. São Miguel: Lagôa dos Furnas, 400 m, 15 July 1972 (fl), *Gonçalves* 4318 (BM); Lagôa do Junco, 770 m, 30 July 1970 (fl), *Dolman* 386 (BM). Pico: Pico, *c.* 600 m, 1 September 1970 (l. fl), *Brooke* 11323 (BM).

H. elodes is clearly derived from sect. *Adenosepalum*, its nearest relative being 13. *H. coadunatum*, from the Canary Islands. With regard to vegetative characters, *H. elodes* is more advanced than the *H. caprifolium* group (Spp. 13–15), and its occurrence in wet habitats is also a more extreme expression of a tendency shared with that group. The pseudo-tubular flower structure of *H. elodes*, however, is quite distinct, although Webb & Berthelot's figure of *H. coadunatum* suggests that the flower of that species may sometimes be basally contracted. The possession of a full-fledged syndrome of characters associated with specialized pollination, however, distinguishes *H. elodes* from all other species of *Hypericum* except those in the distantly related sect. 25. *Adenotrias* (Robson, 1972, 1981: 122) and justifies its position in an admittedly paraphyletic monotypic section. Two distinct basic chromosome numbers have been recorded for this species (n = 10, 8), see p. 209.

The Greek 'ελοδης has been transliterated by various authors as *elodes* or *helodes*, the Greek rough breathing (spiritus asper) sign ' thus being replaced by *h*, which it represents. Although this practice is to be recommended when coining new names based on Greek, an author's original spelling should be retained, and Linnaeus (following Clusius) used the form *elodes*. St-Lager (1880) and Mansfeld (1939) were therefore wrong to correct it to *helodes*.

The habitats of *H. elodes* are everywhere being increasingly threatened by drainage and water-extraction, and so its distributional area has been considerably reduced in the last century or so. The changes are most noticeable in the drier east (e.g. in Germany and north-east England), but they are occurring throughout the range of the species.

Glück (1911) described three forms of *H. elodes* that are related to the depth of water in which it is growing. The *shallow-water form* is finely pubescent with a long, creeping stem bearing oblong-elliptic leaves and giving rise to emergent erect shoots. These bear broadly ovate, often cordate leaves and terminal (though often apparently axillary) inflorescences. Where the water has dried up or the vegetation is dense, the shallow-water form is replaced by the *terrestrial form* (later named *H. helodes* forma *terrestre* Glück), which is essentially similar but smaller and more reduced. In both these forms the creeping stems with 'primary' leaves can overwinter, producing aerial shoots the following summer. Where the water is deeper (up to *c.* 50 cm), a *deep-water form* occurs (*Elodes palustris* forma *submersa* Glück). In it the water shoots, which can exceed 40 cm in length, are paired, unbranched, filamentous, glabrous and sterile, with leaves narrowly to broadly elliptic. Proper leaves are mostly confined to the upper half of the shoot, those toward the base being small or even almost scale-like. If these shoots reach the surface of the water, they can immediately become aerial shoots. Hagemann (1983: 130) likewise demonstrated that the original shoots are plagiotropic, and that lateral shoots from them both (i) terminate in an inflorescence and (ii) produce axillary shoots that flower in the second year.

The seeds of *H. elodes* are shed in August (in Germany), float for about three days, and then sink and overwinter in the mud at the bottom of the pond, etc. They germinate early the following year and are not inhibited by having dried out in the meantime.

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[13] † Extinct.

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