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I. INFRAGENERIC CLASSIFICATION

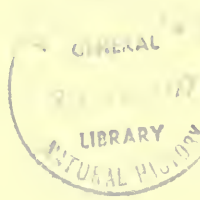
N. K. B. ROBSON

BULLETIN OF
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BOTANY

Vol. 5 No. 6

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Pp. 291-355 ; 9 Text-figures

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THE BULLETIN OF THE BRITISH MUSEUM (NATURAL HISTORY), instituted in 1949, is issued in five series corresponding to the Scientific Departments of the Museum, and an Historical series.

Parts will appear at irregular intervals as they become ready. Volumes will contain about three or four hundred pages, and will not necessarily be completed within one calendar year.

In 1965 a separate supplementary series of longer papers was instituted, numbered serially for each Department.

This paper is Vol. 5 No. 6 of the Botany series. The abbreviated titles of periodicals cited follow those of the World List of Scientific Periodicals.

World List abbreviation:
Bull. Br. Mus. nat. Hist. (Bot.)

ISSN 0068-2292

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BRITISH MUSEUM (NATURAL HISTORY)

Issued 30 June, 1977

Price £7.25

STUDIES IN THE GENUS *HYPERICUM* L. (GUTTIFERAE)

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By NORMAN K. B. ROBSON

ABSTRACT

A historical review of systematic work on *Hypericum* L. is followed by a discussion of evolutionary and nomenclatural problems that have been posed by it and a consideration of evolutionary trends in the genus. A provisional sectional classification with full synonymy is given, along with a provisional key to the sections.

INTRODUCTION

IN THIS paper, the first of a series of studies which, it is hoped, will culminate in a monograph of *Hypericum* L., the delimitation of the genus is outlined and a provisional sectional classification and key is given.

HISTORICAL

The name *hypericum* (*ὑπέρεικον*) was given by the Greeks to a plant or plants that they hung above their religious figures to ward off evil spirits (*ὑπέρ*-above), (*εἰκόν*-image). Exactly which species was so used is not known with certainty, although various authors have suggested that it was *Hypericum empetrifolium* Willd. or *H. triquetrifolium* Turra (*H. crispum* L.). The earliest use of the name that has been traced so far is in the 2nd century B.C. by Nikander (*Alexipharmaca*, V, line 603) :

τῶ δ' ὅτε μὲν σμύρνης ὄδελου πόρε διπλῶν ἄχθος,
ἄλλοτε δ' ὄρμίνιοι νέην χύσω, ἄλλοτε κόψαις
οὐρείην ὑπερέικον, ὅθ' ὑσσώπου ὀροδάμνους.

'And take a double 12-grain dose of myrrh, or a fresh draught of horminium, or pounded mountain hypericum or branches of hyssop.'

The qualification 'mountain' here suggests that more than one species of *Hypericum* may have been recognized at that time.

The name was mentioned by Dioscorides (*Mat. Med.*, I. 3 cap. 171), Galen (12, 148) and Pliny (26. s. 53) ; and the illustration of *Uperikon* in the *Codex Aniciae Iulianae nunc Vindobonensis* : 357r, representing the traditional use of the name, clearly portrays *H. empetrifolium*. Dioscorides also described *Askuron* (M.M. 3, 172) - possibly *H. triquetrifolium* Turra or *H. perforatum* L. - and *Androsaimon* (M.M. 3, 173) - probably *H. perfoliatum* L. The last name appears to have been given to any species that had red sap or glandular secretion that stained the fingers like blood. The description of *Koris* (M.M. 3, 174) also suggests *H. empetrifolium*.

The name *Hypericum* was also used by various 16th and 17th century authors ; but Tournefort (1700 : 254, t. 131) was the first one to give a generic description of *Hypericum*, which he characterized by a trimerous gynoeceum in contrast to the pentamerous gynoeceum of his *Ascyrum* (Tournefort, 1700 : 256, t. 131). His illustration of *Ascyrum* could be of *H. ascyron* L., from E. Asia and eastern N. America, as it shows the partly united styles of that species, although the apparently deciduous petals and stamens that are also portrayed do not fit it. On the other hand, he includes references among his list of species of *Ascyrum* to two that have a trimerous or rarely tetramerous gynoeceum, viz. *H. richeri* Vill. subsp. *burseri* (DC.) Nyman (*Ascyrum magno flore* C. B. Pin. 280, Prodr. 130) and *H. olympicum* L. (*Ascyrum exiguo folio, flore magno*. *Hypericon Olympi Montis Whel. Itin.*). Tournefort also excluded some other species now normally included in *Hypericum*, making separate genera for those with baccate fruits (*Androsaemum*) and whorled leaves (*Coris*).

Linnaeus in his *Genera Plantarum* (1737) recognized the two genera *Hypericum* (5 petals, numerous stamens) and *Ascyrum* (4 petals, numerous stamens). In the *Species Plantarum* (1753) and the fifth edition of the *Genera Plantarum* (1754), he added *Sarothra* (5 petals, 5 stamens).

Miller (1754) also recognized *Ascyrum*, but in the sense of Tournefort (i.e. species with a 5-merous gynoeceum), not of Linnaeus (i.e. species with a 4-merous perianth), syntypes being *H. calycinum* L. and *H. balearicum* L. Whilst he gave a description of the former species, he used for it the name *Ascyrum magno flore* C. B[auhin]. P[inax], which, however, refers to *Hypericum richeri* subsp. *burseri*. Linnaeus (1753 : 784) wrongly included Bauhin's name under *H. olympicum* L. This disagreement between Linnaeus and Miller eventually resulted in a certain amount of confusion. Miller also distinguished *Androsaemum* (species with baccate fruits), but this generic name was not validly published until the following year (Duhamel du Monceau, 1755 : 53).

Other genera in the *Hypericum* affinity were introduced by Colden (in Garden, 1756 - *Gardenia*, non *Gardenia* Ellis, nom. cons.), Adanson (1763 - *Komana, Knifa, Hypericoides, Elodes*) and Linnaeus fil. (1781 - *Brathys*). Unfortunately, A. L. de Jussieu (1789 : 255), in observing that *Hypericum* might be divisible into five separate genera, listed one of them as '*Elodea* Adans.', and this name, as a generic name or sectional epithet, came to be treated as distinct from *Elodes* and as referring to a different taxon (for fuller discussion see below, pp. 305-306).

The first treatment of the whole genus, however, was by Choisy (1821), whose synoptic monograph of the Hypericineae contained seven genera, of which three (*Androsaemum, Hypericum* and *Ascyrum*) comprised his Tribus II^a Hypericeae and together represent *Hypericum* in its current sense, except that he included the species now placed in *Triadenum* Raf. (i.e. *Gardenia* Colden non Ellis). The other two genera in Choisy's Hypericineae vera (*Vismia* Vand., *Haronga* Thouars) comprised Tribus I^a Vismieae, whilst the remaining two (*Carpodontos* Labill., *Eucryphia* Cav.) were classified as Hypericineae anomala. *Androsaemum* was monotypic (*H. androsaemum* L.) and *Ascyrum* was used in the Linnaean sense. The *Ascyrum* of Tournefort, Miller and others was treated, under the epithet

Ascyreia Choisy, as the first of his four sections of *Hypericum* and contained species with usually terminal flowers, unequal entire sepals, numerous stamens and 3–5 styles. The other sections were: *Brathys* (L.f.) Choisy (axillary flowers, equal entire sepals, numerous stamens, 3–5 styles), *Perforaria* Choisy (axillary flowers or panicles, equal and entire or dentate sepals, numerous stamens, usually 3 styles), and *Elodea* Choisy (axillary or terminal flowers, equal entire sepals, 9–15 stamens, 3 styles). The last section, based by Choisy on '*Elodea* Juss.', is now usually treated as the genus *Triadenum* Raf. Choisy's contribution to De Candolle's *Prodromus* (Choisy, 1824) is a somewhat extended version of his 1821 treatment.

In Spach's account of the Hypericaceae (Spach, 1836b, c), the family was divided into two tribes: Desmostemoneae (with 'glands' between the stamen fascicles) and Hypericeae (without such 'glands'). The Hypericeae, divided into 17 genera (13 of them new), corresponded to Choisy's Hypericeae excluding the species with interstaminal 'glands' (*Hypericum aegypticum* L., *H. elodes* L. and those placed by Choisy in *Hypericum* sect. *Elodea*). Each of these three excluded taxa was treated by Spach as a separate genus and the three genera (*Triadenia*, *Elodes* and *Elodea*) constituted his Elodeineae, one of the 'sections' (a misplaced term) into which he divided his tribe Desmostemoneae. His other two 'sections' of this tribe were the Vismineae and the Tridesmineae, both consisting of genera that have always been regarded as distinct from *Hypericum*. The fragmentation of this genus was continued by Jaubert & Spach (1842), who described two more genera in the group.

Meanwhile, in 1837, Rafinesque-Schmaltz, who had in 1808 published as a *nomen nudum* the generic name *Triadenum*, not to be confused with *Triadenia* Spach, gave it valid publication as a name for the genus that Spach had called *Elodea*.

Endlicher (1840) reduced most of Spach's genera to infrageneric taxa in *Hypericum*, thus laying the foundation for Keller's (1893, 1925) later accounts of the genus. Unfortunately, as Brizicky (1969) has pointed out, he did not specify their rank, and this makes for problems in citation. Endlicher distinguished *Ascyrum* L. (4-merous perianth) and '*Elodea* Adans.' [sic!] (with interstaminal 'glands', i.e. *Triadenia*, *Elodes* and *Elodea* of Spach), but placed all the remaining genera of Spach's Hypericeae in *Hypericum*.

Blume (1856) adopted Spach's generic concept except for *Eremanthe*, which he treated as one of two sections of *Norysca* Spach.

Bentham (1862) followed Endlicher's broad concept of *Hypericum*, but went further by including in it those species that Endlicher had referred to *Elodea*. Keller's (1893, 1925) treatments are essentially elaborations of Endlicher's work, except that he, like Bentham, did not recognize *Elodea* in Endlicher's sense as a separate genus but included it in *Hypericum*, thus reducing the Hypericeae to two Linnaean genera, *Hypericum* and *Ascyrum*.

Stefanoff (1932–34, 1933) made a detailed revision of the species of Europe, W. Asia, N. Africa and Macaronesia, describing 40 sections of which 22 were new. His view of *Hypericum* was broad, in that he followed Keller in including all three species with interstaminal glands then known from the area, each in its own section. His new sections, however, were described only, not typified, and only the species of the area under consideration were cited. Subsequent authors dealing with other

TABLE I

Comparison of classifications of *Hypericum* and allied genera

SPACH (1836a, b), JAUBERT & SPACH (1842)	ENGLER (1925), KELLER (1925)	KIMURA (1951)
Hypericaceae Juss.	Guttiferae subfam. Hypericoideae Engl.	Hypericaceae Juss.
Trib. Desmostemoneae Spach	Trib. Vismieae Choisy	Subfam. Vismoioideae Y. Kimura
'Sect.' Vismieae Spach	Trib. Cratoxyleae Benth.	Trib. Vismieae Choisy
'Sect.' Tridesmineae Spach	Trib. Hypericeae Choisy	Trib. Cratoxyleae Benth.
'Sect.' Elodeineae Spach	<i>Hypericum</i> L.	Trib. Elodeae Endl.
<i>Elodea</i> Juss. (non Michx.)	Sect. <i>Elodea</i> (Juss.) Choisy	<i>Triadenum</i> Raf.
<i>Elodes</i> Adans.	Sect. <i>Elodes</i> (Adans.) Syme	<i>Spachelodes</i> Y. Kimura
<i>Triadenum</i> Spach	Sect. <i>Triadenum</i> (Spach) R. Keller	<i>Elodes</i> Adans p.p.
<i>Adenotrias</i> Jaub. & Spach	Sect. <i>Adenotrias</i> (Jaub. & Spach) R. Keller	<i>Elodes</i> Adans p.p.
Trib. Hypericeae Choisy	Sect. <i>Androsaemum</i> (Duham.) Godr.	Subfam. Hypericoideae Engl.
'Sect.' Androsaemineae Spach	Sect. <i>Psorophytum</i> (Spach) R. Keller	Trib. Androsaemeae Y. Kimura
<i>Androsaemum</i> (Duham.) Spach	Sect. <i>Norysca</i> (Spach) R. Keller p.p.	<i>Androsaemum</i> (Duham.) Spach
<i>Psorophytum</i> Spach	Sect. <i>Eremanthe</i> (Spach) Boiss.	Trib. Hypericeae Choisy
<i>Norysca</i> Spach	Sect. <i>Norysca</i> (Spach) R. Keller p.p.	<i>Psorophytum</i> Spach
<i>Eremanthe</i> Spach	Sect. <i>Campyloporus</i> (Spach) R. Keller	<i>Norysca</i> Spach p.p.
<i>Campyloporus</i> Spach	Sect. <i>Roscyna</i> (Spach) R. Keller	<i>Norysca</i> Spach p.p.
<i>Roscyna</i> Spach	Sect. <i>Campylopus</i> (Spach) Boiss.	<i>Takasagoya</i> Y. Kimura
<i>Campylopus</i> Spach	Sect. <i>Webbia</i> (Spach) R. Keller	<i>Hypericum</i> L.
'Sect.' Hyperineae Spach	Sect. <i>Eulhypericum</i> Boiss.	Sect. <i>Campyloporus</i>
<i>Webbia</i> Spach	Subsect. <i>Olympia</i> (Spach) Boiss.	(Spach) R. Keller
<i>Olympia</i> Spach		Sect. <i>Roscyna</i> (Spach)
		R. Keller
		Sect. <i>Campylopus</i> (Spach)
		Boiss.
		Sect. <i>Webbia</i> (Spach)
		R. Keller
		Sect. <i>Olympia</i> (Spach) Stef.

<i>Hypericum</i> L.			
Sect. <i>Holosepalum</i> Spach p.p.	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura p.p.
Sect. <i>Holosepalum</i> Spach p.p.	Subsect. <i>Oligostema</i> Boiss.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura p.p.
Sect. <i>Adenosepalum</i> Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura p.p.
Sect. <i>Taeniocarpium</i> Jaub. & Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura p.p.
Sect. <i>Helianthemoides</i> Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura p.p.
Sect. <i>Milleporum</i> Spach	Subsect. <i>Heterotaenium</i> R. Keller	Sect. <i>Milleporum</i> Spach	
Sect. <i>Drosocarpium</i> Spach	Subsect. <i>Drosocarpium</i> (Spach) Boiss.	Sect. <i>Drosocarpium</i> Spach	
Sect. <i>Coridium</i> Spach	Subsect. <i>Coridium</i> (Spach) Boiss.	Sect. <i>Coridium</i> Spach	
Sect. <i>Crossophyllum</i> Spach	Subsect. <i>Crossophyllum</i> (Spach) Boiss.	Sect. <i>Crossophyllum</i> Spach	
Sect. <i>Arthrophyllum</i> Jaub. & Spach	Subsect. <i>Arthrophyllum</i> (Jaub. & Spach) Boiss.	Sect. <i>Arthrophyllum</i> Jaub. & Spach	
Sect. <i>Triadenioides</i> Jaub. & Spach	Subsect. <i>Triadenioides</i> (Jaub. & Spach) Boiss.	?	
'Sect.' <i>Drosanthineae</i> Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura
<i>Eremosporus</i> Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura
<i>Drosanthe</i> Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura
<i>Thymopsis</i> Jaub. & Spach	Subsect. <i>Homotaenium</i> R. Keller p.p.	Sect. <i>Homotaenium</i>	(R. Keller) Y. Kimura
'Sect.' <i>Brathydineae</i> Spach	Sect. <i>Thasium</i> Boiss.	[in sect. <i>Roscynæ</i>]	
<i>Myriandra</i> Spach	Sect. <i>Humifusoidium</i> R. Keller	Trib. <i>Sarothraeae</i> Y. Kimura	
<i>Brathydium</i> Spach	Sect. <i>Myriandra</i> (Spach) R. Keller	<i>Myriandra</i> Spach	
<i>Brathys</i> Mutis ex L. f.	Sect. <i>Brathydium</i> (Spach) R. Keller	<i>Brathydium</i> Spach	
<i>Isophyllum</i> Spach	Sect. <i>Brathys</i> (Mutis ex L. f.) Choisy	<i>Sarothra</i> L.	
'Sect.' <i>Ascyrineae</i> Spach	<i>Ascyrum</i> L. p.p.	Trib. <i>Ascyraeae</i> Y. Kimura	
<i>Ascyrum</i> L.	<i>Ascyrum</i> L. p.p.	<i>Ascyrum</i> L. p.p.	

NOTE: The taxa placed on the same line are not necessarily coextensive, but they are cotypal.

regions have therefore tended to ignore Stefanoff's sections. In particular, Gorschkova (1949) accepted Keller's subdivision of sect. *Euhypericum* Boiss. into seven subsections, but placed the Russian species of these subsections under 23 new series names, all of which have only Russian descriptions and hence are not validly published.

Kimura (1951) made a partial return to Spach's view of the Hypericaceae, but with a modified nomenclature. His subfamilies Vismioideae and Hypericoideae are coextensive with Spach's tribes Desmostemoneae and Hypericeae respectively, as is shown in Table 1. In addition, within the Hypericoideae, Kimura raised to generic rank a number of Keller's sections of *Hypericum* (*Androsaemum*, *Psorophytum*, *Norysca*, *Myriandra*, *Brathydium* and *Sarothra* (sect. *Brathys*)), as well as including *Ascyrum* and one genus described by himself, *Takasagoya*.

PROBLEMS POSED BY PREVIOUS CLASSIFICATIONS

A study of Table 1 will reveal several major differences of opinion about rank, relationships and nomenclature, all of which must be reconciled before any new classification can be proposed. It will also suggest some more general questions. Apart from differences in ranking, these problems are essentially five in number :

- (1) Should the group as a whole be accorded family status or included in the Guttiferae?
- (2) Should the 'Elodes' group (with interstaminal 'glands') be included in *Hypericum* or are its affinities with the Vismieae and Cratoxyleae?
- (3) Kimura's tribes Sarothreae and Ascyreae (and the equivalent groups of Spach and Keller) contain species in which the androecium is said to be afasciculate, whilst the rest of the groups mentioned in the table have a fasciculate androecium. Which is the primitive condition in the genus?
- (4) All three classifications agree in separating *Ascyrum* L. from *Hypericum*. Is tetramery in the perianth a monophyletic development and, if so, is the group with such a perianth worthy of generic rank?
- (5) What is the type of *Elodes* Adanson and is *Elodea* Juss. a distinct name?

Family or subfamily?

Authors have agreed that the taxa included in Table 1 form a natural group ; but, whereas Spach (1836a, b), Bentham (1862) and Kimura (1951) treated this group as a separate family, Engler (1893, 1925) included it in the Guttiferae as a subfamily coordinate in rank with the Kielmeyeroideae, Calophylloideae, Morono-boideae and Clusioideae. Bentham placed the African monotype *Endodesmia calophylloides* Benth. in the Hypericaceae ; but Engler (1888) transferred it to the Calophylloideae as a separate tribe, Endodesmieae. Along with a closely allied monotype from Zaire, *Lebrunia bushiae* Staner, it is quite out of place in the Hypericaceae, as both genera have multinerved leaves, a 1-seeded drupaceous fruit and (at least *Endodesmia*) a large seed with thick fleshy cotyledons. On the other

hand, all these characters (as well as the complete absence of staminodes) fit well in the Calophylloideae, where I believe that *Endodesmia* and *Lebrunia* belong.

The remaining group, without these two genera, is a natural one falling into three subgroups which can be defined, leaving the 'Elodes' group out of account for the present, as follows (Table 2) :

TABLE 2

Characters of tribes of the Hypericoideae (excluding the 'Elodes' group)

	VISMIEAE	CRATOXYLEAE	HYPERICEAE
FRUIT	Berry or drupe	Capsule	Capsule (rarely subbaccate or tricocoid)
SEED	Not winged	Winged	Rarely winged, sometimes keeled
INTERSTAMINAL GLANDS	Present	Present	Absent
PETAL COLOUR	White, yellow or orange	White or pink	Yellow to orange (rarely red, crimson or white)

The main characters by which these three tribes differ from all the rest of the Guttiferae sensu Engler are :

- (i) The possession of free styles (except in some species of *Hypericum*) ;
- (ii) the occurrence of black glands containing hypericin (except in some species of *Hypericum*) ;
- (iii) the occurrence of the herbaceous habit (in some species of Cratoxyleae and Hypericeae) ;
- (iv) the predominance of translucent glands rather than canals.

All these distinctions, however, are only partial. Indeed, the transitions from united to free styles, absence to presence of black glands, trees to herbs and glandular canals to dots can all be observed in *Hypericum* itself. It seems clear, therefore, that the appropriate rank for the taxon that includes the tribes Vismieae, Cratoxyleae and Hypericeae is that of a subfamily of the Guttiferae – the Hypericoideae – coordinate with the Calophylloideae, Moronoboideae and Clusioideae. The subfamily Kielmeyeroideae is probably better removed from the Guttiferae to the Bonnetiaceae (Maguire, 1972 ; Hutchinson, 1973). However, my recent research has indicated that the tribes of the Hypericoideae are less closely interrelated than I had thought and that they may have originated independently from pre-Bonnetiaceae ancestors. If this is so, then the Guttiferae should probably be enlarged to include the Bonnetiaceae.

The 'Elodes' group – primitive or specialized ?

As the historical review showed, there has been much disagreement over the systematic position of Keller's first four sections of *Hypericum* (sects *Elodea*, *Elodes*,

Triadenia and *Adenotrias*), the view adopted depending on whether the authors regarded their anomalous floral structure as more or less important than their undoubted vegetative resemblances to *Hypericum*.

Keller's four sections can be reduced to three, as sections *Triadenia* and *Adenotrias* are very closely allied, differing only in having (i) persistent petals, usually 1-flowered inflorescences and ovary loculi with seeds in three rows (*Triadenia*) or (ii) deciduous petals, 3–8-flowered inflorescences and ovary loculi 2-seeded (*Adenotrias*). The resemblances between these two groups – they both comprise glabrous ± microphyllous Mediterranean shrubs with nectariferous petal appendages, fleshy hypogynous 'glands', dimorphically heterostyled flowers and carunculate seeds – are so much greater than their differences that it seems appropriate to unite them. *Triadenia* is the correct (earlier) name if the united taxon is treated as a genus, but *Adenotrias* must be used at the sectional level, and the rank adopted depends on the view taken of its affinities.

This united taxon, which for convenience will be referred to as a section of *Hypericum*, and the other two sections of the 'Elodes' group are all well distinguished from one another, and it is clear that their relationships are by no means close (Table 3). Sect. *Elodea* differs from all other *Hypericum* species in having petals imbricate but not contorted in bud and a chromosome number of $n=19$, and from nearly all in its pink or white petals and axillary flowers. In *Hypericum*, the petals are always contorted in bud and nearly always yellow, often more or less red-tinged. Only very rarely is the yellow flavone absent, giving white or pinkish-tinged petals (*H. aviculariifolium* Jaub. & Spach var. *albiflorum* Hub.-Mor.), or the red pigment so intense as to give orange-red to crimson petals (*H. capitatum* Choisy var. *capitatum*). The inflorescence in *Hypericum* is never truly axillary, and the basic chromosome number varies from 7 to 12, never to 19 (Robson & Adams, 1968).

For these and other reasons (cf. Robson, 1956), it seems appropriate to remove sect. *Elodea* from *Hypericum* altogether. If this is done, it fits into the system very well as a herbaceous derivative of *Cratoxylum* Blume, an Indo-Malayan genus of the Cratoxyleae. All the features of *Triadenium* Raf. (i.e. *Hypericum* sect. *Elodea*) that are anomalous in *Hypericum* are typical of *Cratoxylum* except the chromosome number; but this difference may not be significant as only one chromosome count of one species of *Cratoxylum* has been published, $n=7$ (see Robson & Adams, 1968). The relative distributions of the two genera agree with the hypothesis that one is derived from the other. Apart from the very closely allied genus *Eliea* Cambess., endemic to Madagascar (Baas, 1970), the Cratoxyleae have hitherto consisted only of *Cratoxylum*, which occurs from Celebes and the Lesser Sunda Islands to S. China and Assam (Gogelein, 1967). The distribution of *Triadenium* (Khasia, N.E. Asia, eastern N. America) is quite in keeping with the idea that it has spread into temperate regions while evolving a herbaceous habit. The species of *Triadenium* all have pink or reddish petals except for the one that occurs in Khasia (Assam) and is geographically closest to *Cratoxylum* (*T. breviflorum* (Wall. ex Dyer) Y. Kimura), in which they are white. This species has recently been recorded from Taiwan (Robson, 1976), a discovery that helps to bridge the gap in distribution between Assam, on the one hand, and Japan, Korea and adjacent

TABLE 3

Comparison of members of the 'Elodes' group of *Hypericum*

	SECT. <i>Adenotrias</i>	SECT. <i>Elodes</i>	SECT. <i>Elodea</i>
HABIT	low shrubs	rhizomatous herb	rhizomatous herbs
RED GLANDS	absent	present	absent
INDUMENTUM	absent	present	absent
LEAVES	sclerophyllous	herbaceous	herbaceous
INFLORESCENCE	terminal	terminal	axillary
SEPAL MARGIN	entire	gland-fringed	entire
PETAL AESTIVATION	contorted	contorted	imbricate only
PETAL COLOUR	yellow	yellow	pink or white
PETAL DURATION	variable	persistent	deciduous
PETAL APPENDAGE	entire	trifid	absent
HYPOGYNOUS 'GLANDS'	fleshy	scale-like	scale-like
HETEROSTYLY	present	absent	absent
PLACENTATION	axile	parietal	axile
SEEDS PER PLACENTA	numerous or 2	numerous	numerous
TESTA	pitted	scalariformly striate	pitted
CARUNCLE	present	absent	absent
CHROMOSOMES (2n)	20	32	38
HABITAT	dry rocks	aquatic or subaquatic	marshes
DISTRIBUTION	Mediterranean	W. Europe, Azores	E. Asia, eastern N. America

Siberia on the other. (For a map of the distribution of the Cratoxyleae, excluding Taiwan, see Robson, 1972.)

A further link between S.E. Asia and America in the tribe Cratoxyleae is provided by two species from southern Mexico that have wrongly been included in *Hypericum* (*H. matudai* Lundell and *H. calcicola* Standley & Steyerl.). These species have flowers with some characters of *Triadenum* (pink petals and an androecium of three fascicles, each of three stamens, alternating with three hypogynous 'glands'), but they differ in being much-branched shrubs with smaller leaves and flowers, filaments free to near the base, and seeds with a small caruncle (at least in *H. calcicola*). These two species constitute a separate genus, *Thornea*, very recently described as new by Dr D. Breedlove and Dr E. McClintock (1976), which would seem to have been derived directly from *Cratoxylum*.

When *Triadenum* and the new genus, *Thornea*, are excluded, the species of the 'Elodes' group look superficially like true *Hypericum*s although, as Table 3 indicates, the members of the two remaining sections differ markedly in many respects other than the possession of petal appendages, hypogynous 'glands' and (not mentioned in Table 3) stamen filaments united to above the middle. If these specialized characters and the heterostyly and carunculate seeds are ignored, then sect. *Adenotrias* agrees well with sects *Triadenioides* and *Heterophylla*, which also contain dwarf microphyllous shrubs of the eastern Mediterranean. In the same way,

H. elodes, the one species of sect. *Elodes*, agrees well with sect. *Adenosepalum*, which includes two species of damp habitats from areas adjacent to that of *H. elodes* (*H. caprifolium* Boiss. from S.E. Spain and *H. coadunatum* Chr. Sm. from the Canary Islands and N. Africa). Both these species have pubescent stems and leaves and bear a strong resemblance to *H. elodes*, although in both the leaves are perfoliate, not free as in *H. elodes*. (For distribution maps of all the above taxa, see Robson, 1972).

It seems clear, then, that sects *Adenotrias* and *Elodes* are derivatives of *Hypericum* itself, not of the shrubby genera in the Vismieae and Cratoxyleae, and that their various morphological anomalies are developments from within *Hypericum*. A study of the floral anatomy of these groups supports this view. Whereas the sterile stamen fascicles in the Vismieae and Cratoxyleae (including *Triadenum*) have vascular connections with the stele, those of the hypogynous 'glands' in *Hypericum aegypticum* L. (the type species of *Triadenia*) and *H. elodes* have none (Robson, 1956, 1972).

If the various adaptations in the flowers of sects. *Adenotrias* and *Elodes* are regarded from a functional viewpoint, they can all be shown to be modifications towards specialized insect pollination. Thus the sepals in both sections are erect, so that the bases of the petals form a tube and the upper parts spread out, giving the effect of a rotate tubular corolla. In this connection, it is noteworthy that these species with a pseudo-tubular corolla are the only ones in the genus to have the stamen filaments united for more than a short way above the base. The petal appendages, which appear to be nectariferous, are unknown elsewhere in the Guttiferae except in *Cratoxylum* sects *Triadesmos* and *Isopterygium*, where they also seem to have arisen 'de novo' along with dimorphic heterostyly.

Hochreutiner (1918) showed that the hypogynous bodies in the Guttiferae are not glandular and do not secrete nectar. In *Hypericum elodes*, *Psorospermum* (Vismieae) and *Eliea* (Cratoxyleae) at least, and probably also in *Cratoxylum*, they act like lodicules of grasses and help to expand the petals and sepals from the bud. When, furthermore, the dimorphic heterostyly in *Hypericum* sect. *Adenotrias* and the above-mentioned sections of *Cratoxylum* are taken into consideration, the conclusion is inescapable that there have been at least three independent evolutionary trends in the Hypericoideae towards specialized insect pollination, viz. in *Hypericum* sect. *Adenotrias*, *Hypericum* sect. *Elodes* and *Cratoxylum*.*

The question remains whether the 'lodicules' in *Hypericum* have no evolutionary forerunners at all (i.e. have truly arisen 'de novo') or are homologous with the hypogynous bodies in the rest of the Guttiferae (where they are staminodal in origin). When the functional aspects discussed above are taken into consideration, the latter would appear to be the more likely hypothesis, i.e. that the lodicules in *Hypericum* are staminodal. If this is so, then we have a case of evolutionary recall, in which organs which have atrophied during the course of evolution have been subsequently regained but perform a function different from their original one. (For a more detailed discussion of these ideas see Robson, 1972).

* Dimorphic heterostyly also occurs in several species of *Vismia* (Robson, ined.).

The fasciculate androecium – primitive or specialized?

In *Hypericum* sensu Keller there are four sections in which the stamens are described as either all free or all united at the base to form a short tube, not in fascicles. These are sects *Campylopus*, *Myriandra*, *Brathydium* and *Brathys* (Table 1). The monadelphous in sect. *Campylopus*, a section which comprises only *H. cerastoides* (Spach) N. Robson (*H. rhodoppaeum* Friv.), is clearly secondary. Apart from the fact that the monadelphous is not constant, so that flowers with five, four or three stamen fascicles occur not infrequently, *H. cerastoides* forms a morphological link between two sections (*Olympia* and *Origanifolia*) in which all the species have fasciculate androecia. That the stamens of *H. cerastoides* are also basically fasciculate is borne out by a study of the floral vasculature (Robson, 1956).

The remaining sections fall into two groups. Sects. *Myriandra* and *Brathydium* contain species with appressed styles, small stigmas and a mass of apparently free stamens, whilst in sect. *Brathys* the styles are divergent with often capitate stigmas and stamens arising from a narrower zone of the receptacle. An investigation of the floral vasculature of these sections (Robson, 1956) showed that the numerous stamens in the large-flowered species are always innervated from five antepetalous branching vascular trunks, just like those serving the androecia of the 5-fascicled species in other sections. The vascular pattern becomes somewhat irregular in the small-flowered herbaceous species of sect. *Brathys* subsect. *Spachium*, as it does in small-flowered herbs elsewhere in the genus; but all the variation can be explained in terms of a basically isomerous, pentamerous flower with numerous stamens in each of the five fascicles. The morphological trends in *Hypericum* also make sense only if such a flower is taken to be primitive.

An indication of the possible cause of the disappearance of fascicles in sects *Myriandra*, *Brathydium* and *Brathys* resulted from a study of their floral anatomy (Robson, 1956). In the first two sections the floral receptacle is relatively narrow, the androecial zone is relatively broad and the vascular traces are close together, suggesting that evolution has resulted in a crowding of the stamen fascicles. In contrast, the floral receptacle in the large-flowered species of sect. *Brathys* is relatively broad, the androecial zone is relatively narrow and the vascular traces are spaced out, suggesting that evolution has resulted in the 'squeezing out' of the stamen fascicles to form a continuous ring. This hypothesis is supported by the observation that, in more advanced species of sect. *Spachium* in which there are fewer stamens (hence making a complete ring less easily formed), the fascicles are sometimes visible. In the extreme case of *H. gentianoides* (L.) Britt., Sterns & Poggenb., an annual herb with scale-like leaves, each fascicle is often reduced to one stamen. It is not surprising, therefore, that Linnaeus placed this species in his Class Pentandria as the only species of the genus *Sarothra*.

The answer to the question posed in the heading to this section is clearly, then, that the fasciculate androecium in *Hypericum* is primitive, not specialized. The non-fasciculate and monadelphous states should be regarded as the result of the merging of fascicles equal in number to the petals and opposite them.

In many species of *Hypericum* with fasciculate androecia, however, the number of fascicles appears to be smaller than that of the petals. This phenomenon has been shown by various authors (Payer, 1857; Sachs, 1875; Hirmer, 1918; Breindl, 1934; Saunders, 1936, 1939; Robson, 1956) to be due to the merging of adjacent pairs of fascicles, with the result that the 4 fascicles are really $1 + 1 + 1 + (2)$ and the 3 fascicles commonly found are $1 + (2) + (2)$. These double fascicles are always opposite sepals (i.e. *between* petals), in fact opposite the last-formed sepals (sepal 5 in 4-fascicled flowers, sepals 4 and 5 in 3-fascicled ones). Although they are double structures, they have fewer than double the number of stamens found in the single fascicle (between sepals 1 and 3), and the one opposite sepal 5 is usually smaller than that opposite sepal 4 (cf. Saunders, 1936 : 316).

The genus Ascyrum L. – distinct or not?

Linnaeus distinguished *Hypericum*-like plants with four petals and four sepals as the genus *Ascyrum*, a view that was accepted by most subsequent workers up to and including Adams (1957). Spach (1836b) separated as the genus *Isophyllum* one species (*I. drummondii* Spach) which differed from the others in having four equal sepals instead of two small outer sepals and two large inner ones. In this generic separation he was followed by Small (1903), who, however, overlooked Spach's name and called the same species *Crookea microsepala* (Torrey & Gray) Small, based on *Ascyrum microsepalum* Torrey & Gray. Following observations that the American species of *Ascyrum* are closely related to *Hypericum* sects *Myriandra* and *Brathydium* (Robson, 1956), these species of *Ascyrum* and *Isophyllum* were transferred to *Hypericum* by Adams & Robson (1961). Subsequently, Adams (1962) enlarged *Hypericum* sect. *Myriandra* to include all American species previously placed in sect. *Brathydium* or in *Ascyrum* or *Isophyllum*.

The word 'American' is used above because Dyer (1874) described a species from Sikkim with a tetramerous perianth as *Ascyrum filicaule*. Apart from the number of sepals and petals, however, this plant bears little resemblance to the American *Ascyrum* species. Thus, it is a dwarf herb with persistent petals, 'three' stamen fascicles, divergent styles, black glands on the anthers and petiolate leaves, whereas the American species are shrubs or shrublets with deciduous petals, an 'afasciculate' androecium, styles appressed at least at the base, no black glands, and sessile or amplexicaul leaves. *A. filicaule* is therefore not at all closely related to the American plants, but represents an independent development of tetramery in the perianth whorls. Its nearest relative would appear to be the Himalayan *Hypericum monanthemum* Hook. f. & Thoms. ex Dyer (sect. *Adenosepalum*), from which it is probably derived. Indeed, a study of the range of variation in the two 'species' has shown that, whereas the type of *H. monanthemum* falls with the variation range of *H. napaulense* Choisy, most of the specimens that have been determined as *H. monanthemum* cannot be distinguished from *Ascyrum filicaule*, apart from the number of petals and sepals. A validation of the last-mentioned name in *Hypericum*, as follows, is therefore required :

Hypericum filicaule (Dyer) N. Robson, *comb. nov.*

H. filicaule Hook. f. & Thomson, ex Dyer in Hook. f., *Fl. Brit. India*, 1 : 252 (1874) *nom. synonym.*

Ascyrum filicaule Dyer, *loc. cit.*

The names Elodes Adanson and Elodea Juss.

In establishing the genus *Elodes*, Adanson (1763 : 444) cited Clus. Hist., a reference to *Ascyrum supinum* (ελοδης) of Clusius, Rar. Pl. Hist. App. Alt. (1601). Clusius gives a good description of *Hypericum elodes* L., which can therefore be taken as one element of Adanson's protologue. As a synonym, however, Adanson also cited *Hypericum* 9. *Lin. Sp.* 784, which refers to the original description of *H. aegypticum* L. in *Species Plantarum* (1753). The name *H. elodes* L. did not appear until 1759, however, when Linnaeus's dissertation entitled *Flora Anglica* was re-published (Amoen. Acad. 4 : 105) ; and so Adanson's omission of a reference to a Linnaean account of that species should not be over-emphasized. Indeed, in the Table at the end (Adanson, 1763 : 553) he cites '*Hypericum* Tour.' as a synonym of *Elodes*, and Tournefort (1700 : 255) mentions *H. elodes*, as *Hypericum palustre, supinum, tomentosum* (with references to Bauhin and Clusius), among his species of *Hypericum*. *H. aegypticum*, on the other hand, was unknown to Tournefort. There are, therefore, three elements in Adanson's protologue of *Elodes* of which one (the *Species Plantarum* citation) refers to *H. aegypticum* L. and the other two (the references to Clusius and Tournefort) indicate *H. elodes* L. These two species may thus be regarded as syntypes of *Elodes* Adanson, as Adanson's description applies to them both equally.

The first author to restrict *Elodes* to one of these species was Spach (1836a), who erected the genus *Triadenia* for *H. aegypticum* L. sensu lato, leaving only *H. elodes* L. in *Elodes* as *E. palustris* Spach. All subsequent authors have followed Spach's typification, whether they treated *Elodes* as a genus or a section, except Kimura (1951) and Greuter (1965), who decided in effect that the type must be *H. aegypticum*. Kimura's decision, which was apparently based on the argument that Adanson actually cited that species only, meant that Spach's *Elodes* required a new name. He therefore coined the name *Spachelodes*. If one takes the view that Adanson's *Elodes* has two syntypes of which one, *H. elodes* L., became the lectotype as a result of Spach's work, then Kimura's new genus is superfluous, a conclusion which appears to accord best with the facts explained above.

Interpretations of Adanson's genus have led to further confusion in that A. L. de Jussieu (1789 : 255), in observing that *Hypericum* was divisible into five separate genera, spelled the name of one of them '*Elodea* Adans.' Although this spelling is merely an orthographic change, it was adopted by Pursh (1814) and Choisy (1821, 1824), the latter reducing it to a section of *Hypericum*. In addition, however, Choisy followed Pursh in restricting his taxon to those American species with pink flowers that are now usually placed in *Triadenum* Raf. (1837). Spach (1836) restored Choisy's section to generic rank as '*Elodea* Adans. (non Michx.)',

while, as mentioned above, placing *H. elodes* L. and *H. aegypticum* L. in *Elodes* Spach and *Triadenia* Spach respectively. He later added another new genus to this group, *Adenotrias* Jaub. & Spach (1842). Keller's (1893, 1925) treatment of these taxa as the first four sections of *Hypericum* essentially follows that of Choisy and Spach, as a list of his sectional names and cited authorities indicates: Sects. *Triadenia* (Spach) R. Keller [*H. aegypticum* L. sensu lato], *Adenotrias* (Jaub. & Spach) R. Keller [*H. russeggeri* Fenzl], *Elodes* (Adans.) R. Keller [*H. elodes* L.], *Elodea* (Juss.) Choisy [*Triadenum* Raf.].

Finally, it should be pointed out that, as *Elodea* Juss. (1789) is not a valid name, *Elodea* Michx. (1803: 20), with its well-known species *E. canadensis* Michx., is not threatened by it.

RELATIONSHIPS AND EVOLUTIONARY TRENDS IN *HYPERICUM*

It is clear that, although Keller's classification contains some natural groups (e.g. sect. *Norysca*), others consist of several unrelated elements (e.g. sect. *Euhypericum*). An attempt has therefore been made to review the available evidence in order to detect evolutionary trends within *Hypericum*, in the hope that this would lead to a more natural system for the genus. This has involved original studies in morphology, distribution, floral vasculature and (to a limited extent) cytology, as well as a detailed examination of the relevant literature. In the process, provisional ideas about the direction of certain trends have had to be altered in the face of evidence from trends going in the opposite direction. For example, hypotheses that deciduous petals and stamens and divergent styles are primitive have proved untenable. In general, it has been possible to establish congruent trends throughout the genus. Certain characters, such as parietal placentation, deciduous petals and stamens, reduced basic chromosome numbers and modifications towards specialized entomophily, have apparently arisen independently more than once in the genus; but these parallelisms have rarely led to doubt about relationships. On the other hand, it has proved rather more difficult to sort out the several evolutionary lines in Keller's sect. *Euhypericum*, all of which have attained the floral structure of 'three' stamen fascicles, three divergent styles and axile placentation.

As a result of this review, the following trends can be postulated as consistent with the general picture of evolution in *Hypericum*:

Habit Trees → shrubs → perennial herbs → annual herbs.

Indumentum Absent → present (several independent occurrences).

Glands In general there are two types: (i) schizogenous cavities surrounded by secretory cells containing tannins, waxes or resins (Coutinho, 1950), which are described as pale or pellucid dots, lines or canals; (ii) masses of secretory cells without cavities, containing a waxy substance and often also *hypericin*, which are described as amber, red or black (or sometimes merely 'dark') dots or lines. The distribution of these two types is not completely independent; there seems to be a tendency for dark glands to occupy sites corresponding to those of pale

glands in related species. No detailed comparative anatomical study of such a pair of related species appears to have been made. Pale canals appear to be generally more primitive than pale dots within the genus, whereas dark dots are apparently more primitive than dark streaks or lines. There is a tendency to increase the amount of dark secretory tissue in any one evolutionary line in which it has appeared; but this trend is occasionally reversed. Thus, some advanced members of sect. *Adenosepalum* (see p. 335) have fewer black glands than the primitive ones, whilst in sect. *Elodes* (apparently derived from sect. *Adenosepalum*) only red glands occur, indicating the presence of less dense concentrations of hypericin. (See Mathis (1963) for a detailed study of these secretions.)

Stem In general the trend runs as follows :

4-lined→2-lined→terete ; but reversals are not uncommon.

Leaves

Sessile— $\left\{ \begin{array}{l} \rightarrow \text{shortly petiolate} \\ \rightarrow \text{amplexicaul} \rightarrow \text{perfoliate.} \end{array} \right.$

Deciduous (with basal articulation)→persistent (without basal articulation).

Opposite→whorled in 3s→whorled in 4s.

Venation parallel→reticulate.

Sepals

Unequal→equal (with occasional reversals).

Margin entire→dentate→ciliate→fimbriate.

Persistent→deciduous.

Free→united.

Petals

Persistent→deciduous (several independent occurrences).

Asymmetric→symmetric.

Perianth

5-merous→4-merous (two independent occurrences).

Stamen fascicles

5→4.

Free→variously united (2 + 1 + 1 + 1, 2 + 2 + 1, (5), (4)).

Persistent→deciduous (several independent occurrences).

Styles and placentae

5→2 (with rare reversals from 3 to 4 or 5).

Placentation

Loosely axile— $\left\{ \begin{array}{l} \rightarrow \text{definitely axile.} \\ \rightarrow \text{parietal.} \end{array} \right.$

Ovules per placenta $\infty \rightarrow 2$ (? 1).*Seeds*Narrowly winged \rightarrow carinate \rightarrow cylindrical.*Basic chromosome number*12 \rightarrow 7 (? 6).

On the basis of the above and other less general trends, it has been possible to construct a revised scheme of classification for *Hypericum*. Fig. 1 is an attempt to show this in broad outline in relation to some of these trends, and the geographical relationships of the sections are indicated in Fig. 2. These geographical relationships fit a hypothesis that *Hypericum* evolved in Africa and spread to America, Asia and probably Australia before the disintegration of Gondwanaland. For discussions of the apparently anomalous distributions of some herbaceous species of sect. *Spachium*, see Robson (1972, 1973). In Figs 3-9, the distributions of the sections are shown, along with indications of morphological trends.

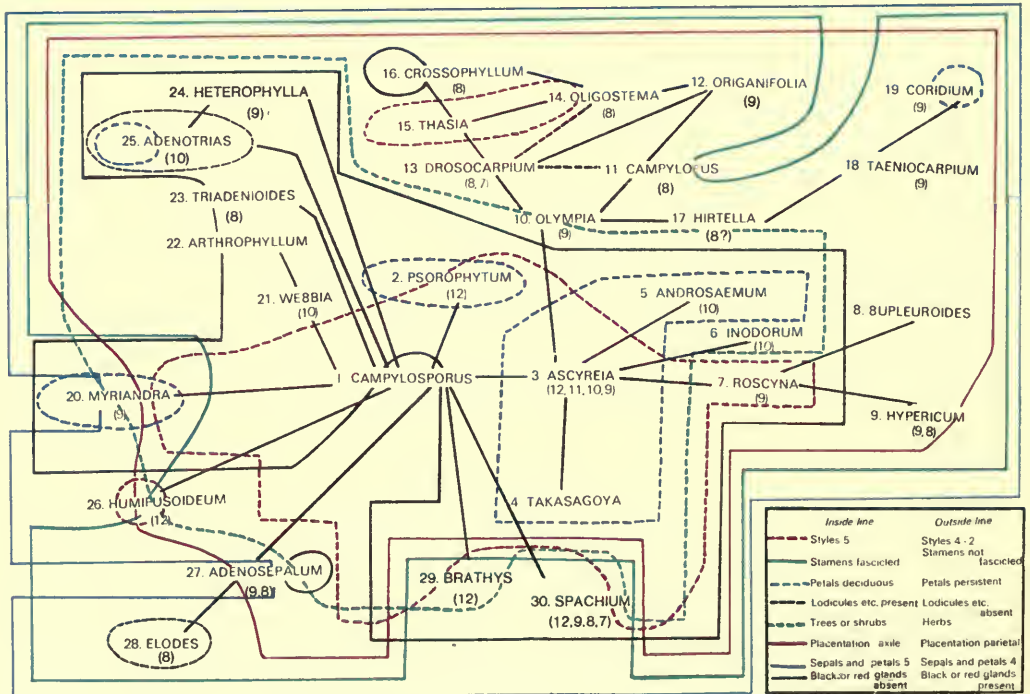


FIG. 1. Proposed classification of *Hypericum*, showing suggested interrelationships and the distribution limits of certain characters. The numbers in parentheses are basic chromosome numbers.

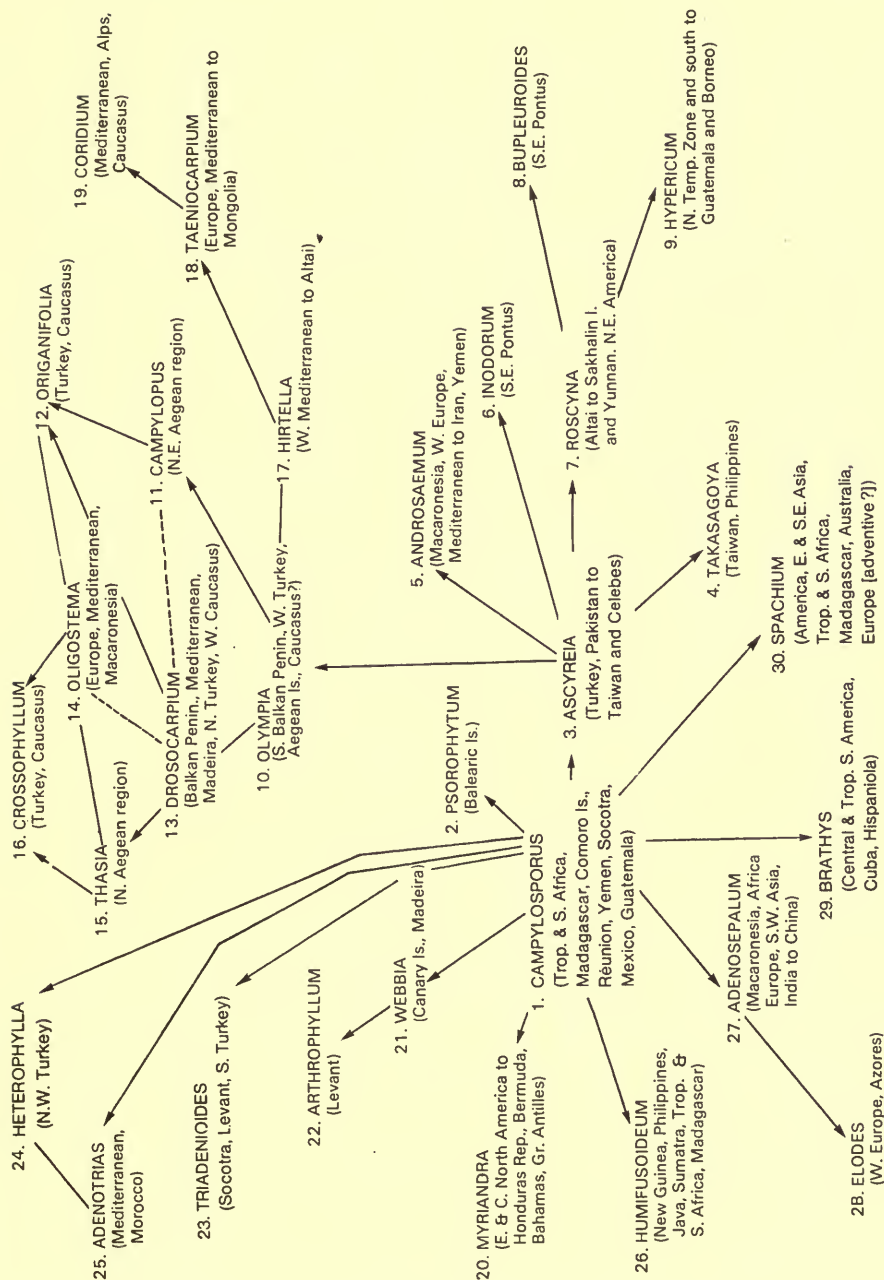


Fig. 2. Proposed classification of *Hypericum*, showing suggested interrelationships and the general distribution of each section. (Under sect. 5 *Androsaeumum* for 'Yemen' read 'Asir'.)

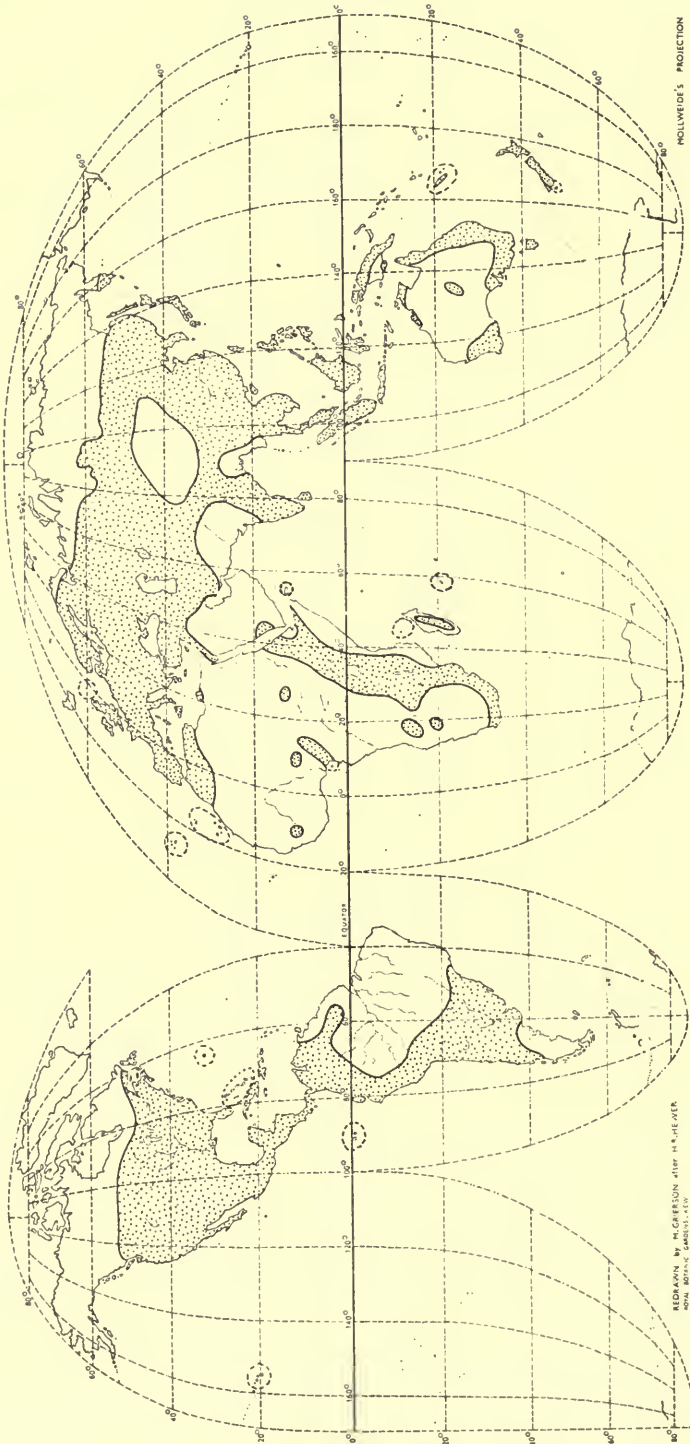


Fig. 3. World distribution of *Hypericum*.

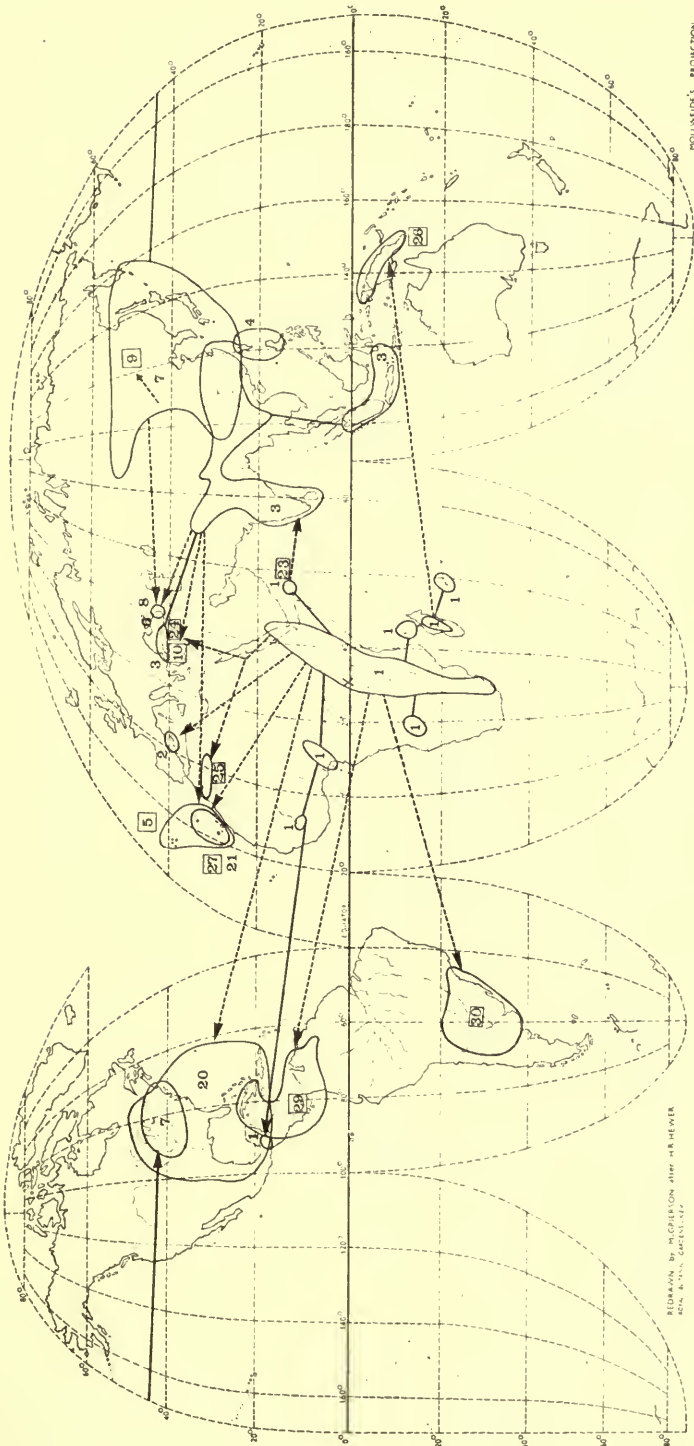


FIG. 4. Distribution of the most primitive section (1. *Campyloporus*) and those immediately related to it and their morphological trends. Sectional numbers in squares denote that only the area of the most primitive species or group of species in the section is indicated, or (sects 9, 10, 24) that the precise area of distribution has not been shown. The area of the most primitive species in the genus (*H. bequaertii* De Wild.) is shown by 'x'. Sect. *Campyloporus* does not occur in America as indicated here; see footnote, p. 316.

REDRAWN BY HIGGELSON FROM HERBARIUM, B. & P. GARDNER, 1917.

MOLLWEIDE'S PROJECTION

C. B. GARDNER, 1917, PL. 31, 1-14

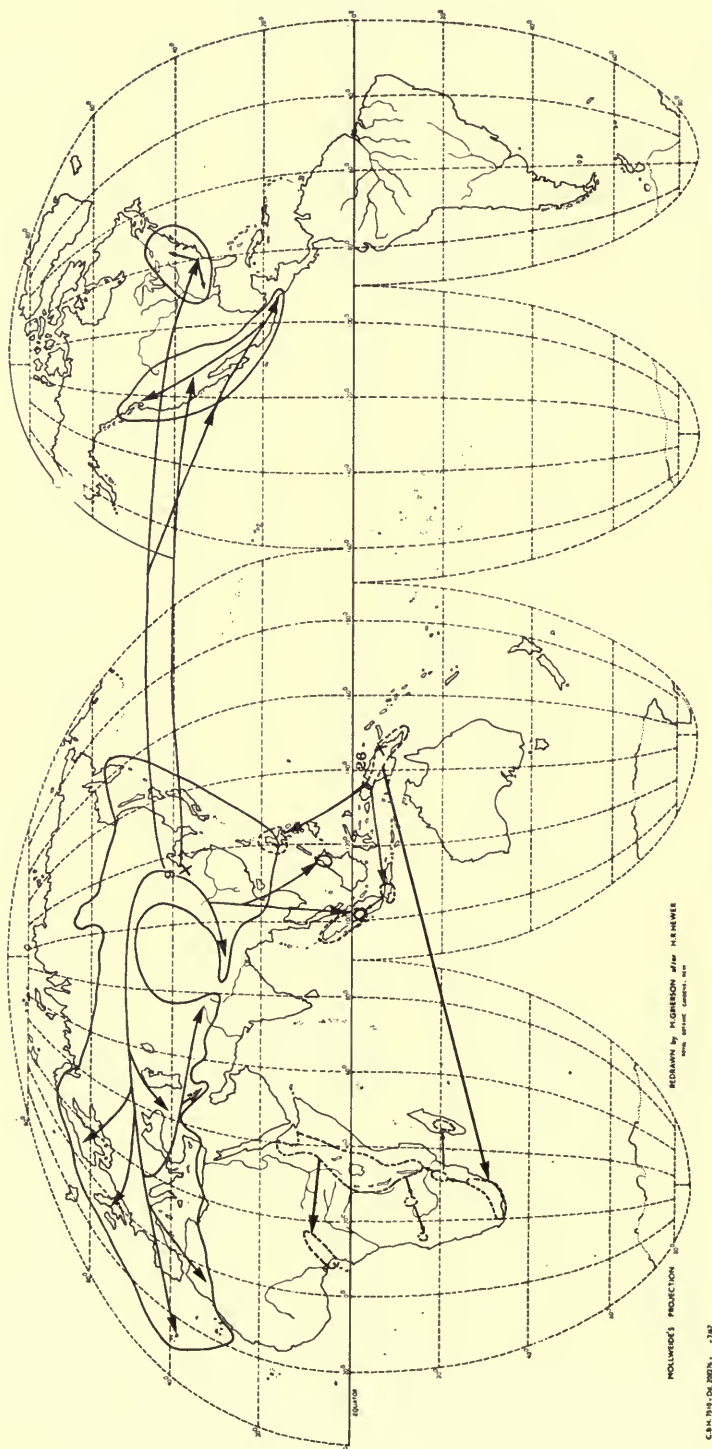


FIG. 5. Distribution of sects 9, *Hypericum* and 26, *Humifusoidem* and their morphological trends. Their centres of distribution are each indicated by 'x'.

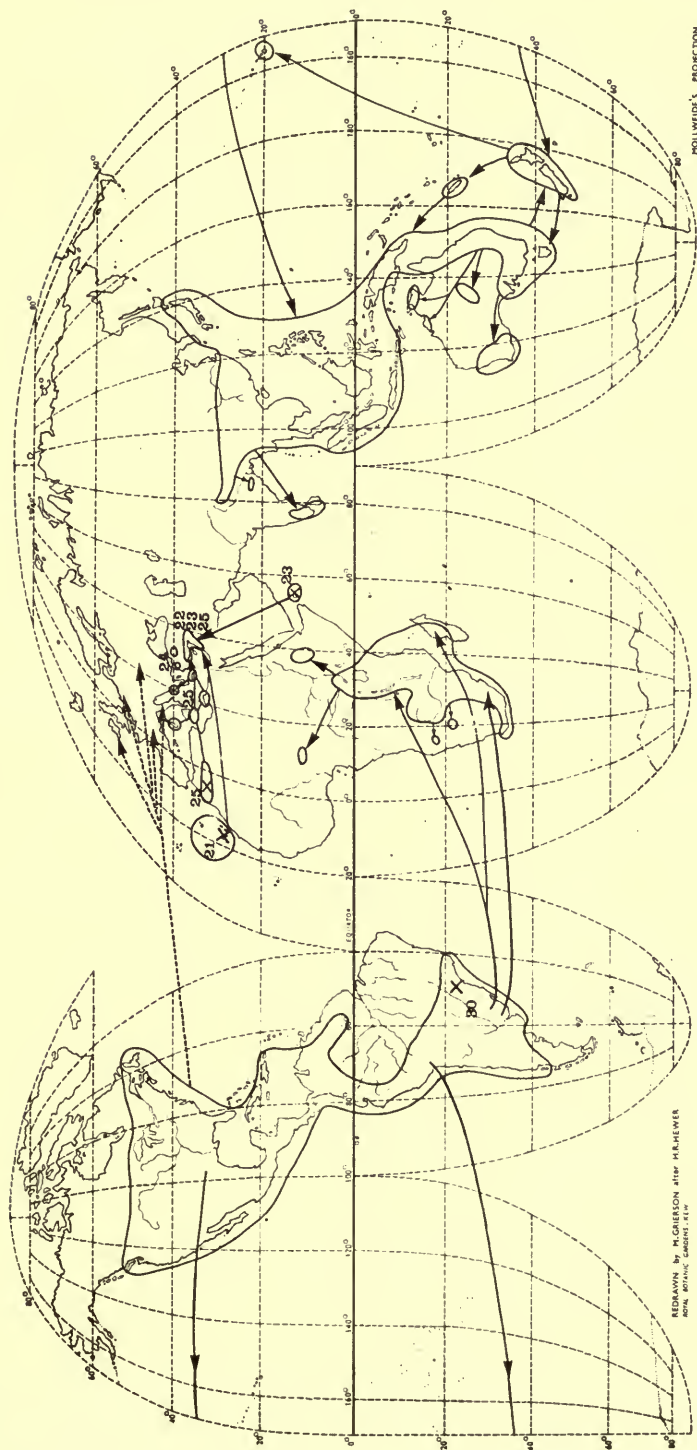


FIG. 6. Distribution of sects 21. *Webbia* to 25. *Adenotrias* and 30. *Spachium* and their morphological trends. Their centres of distribution are each indicated by 'x', unless their area is small. Interrupted arrows show the occurrence in Europe of N. American species, at least some of which appear to have been introduced there.

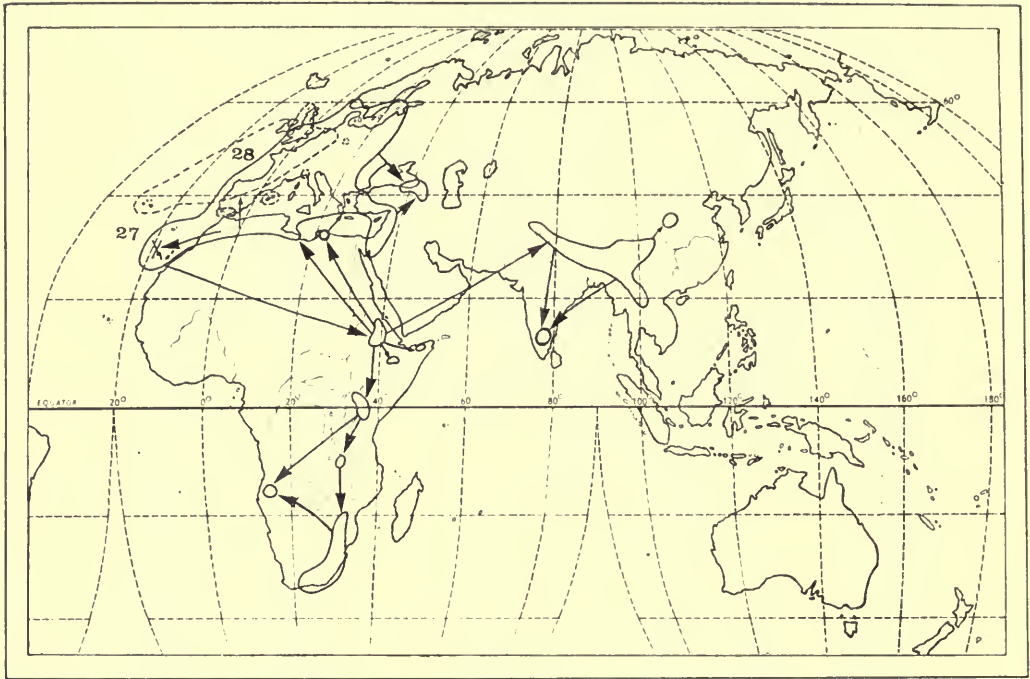


FIG. 7. Distribution of sects 27. *Adenosepalum* (—) and 28 *Elodes* (---) and their morphological trends. The areas of the most primitive species in sect. 27 (*H. glandulosum* Ait. and *H. reflexum* L. f.) are indicated by 'x'.



FIG. 8. Distribution of the species of groups of sect. 5. *Androsaeum*: *H. grandifolium* Choisy and *H. foliosum* Ait. (-|-|-|), *H. hircinum* L. sensu lato (—), *H. androsaeum* L.

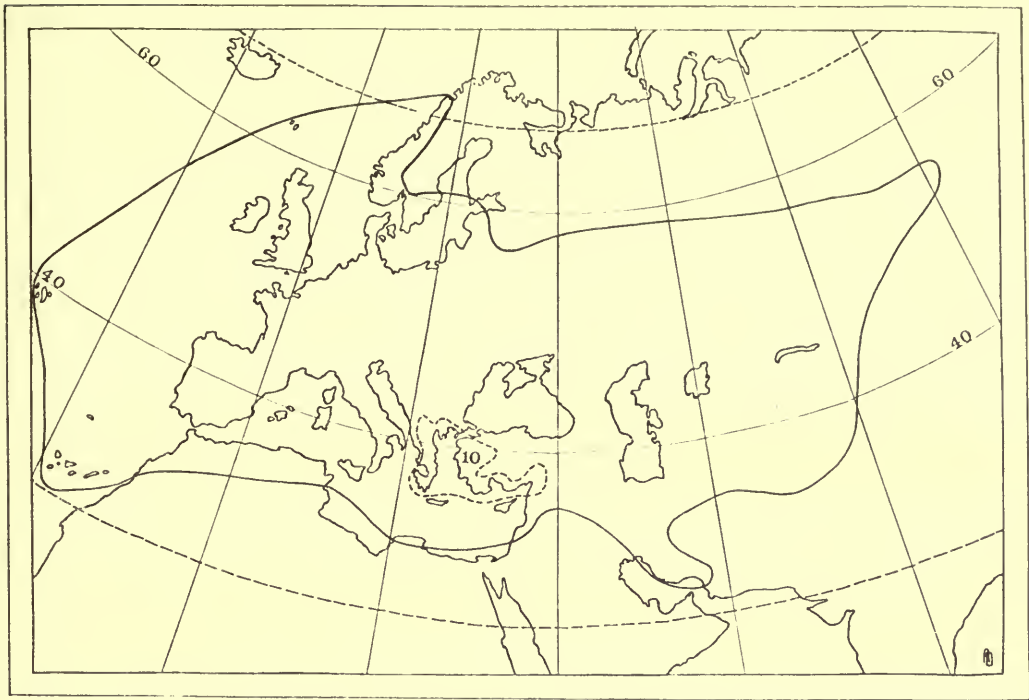


FIG. 9. Distribution of sects 10. *Olympia* to 19. *Coridium* (—) overall and of sect. 10 alone (----).

PROVISIONAL SECTIONAL CLASSIFICATION OF *HYPERICUM*

The sections recognized are listed below, together with their type species and their synonymy, and also an indication of the species that they contain, their geographical distribution, and the basic chromosome numbers and ploidy that have been recorded. Synonyms are entered under the section to which their type species belongs and also elsewhere if their original circumscription included species now placed in other sections. Type species are indicated for taxonomic synonyms. No synonymy is given under the generic name, since all the generic synonyms are quoted under one or other of the sectional names.

All the subdivisions of the genus considered here are treated as sections, but future work may well result in some changes in rank. For example, Sections 10–19 (*Olympia* group) may best be regarded as subsections of a single section; on the other hand, it may be necessary to recognize subsections in Sections 9 (*Hypericum*) or 27 (*Adenosepalum*), both of which are large and variable. Adams (1962) has already proposed a division of the enlarged Section 20 (*Myriandra*) into subsections; these will be considered in a later paper.

Notes on nomenclature

Although this treatment is described as provisional, in the sense that the author considers that further studies in the genus may cause him to modify details of it,

all the sectional taxa recognized below are accepted by him, and the new combinations proposed are not provisional names but validly published ones.

In preparing the synonymies that follow, a decision had to be made on a point where the application of the rules was uncertain. Boissier in the *Flora Orientalis* reduced certain previously published sections whose epithets had the form of substantives to the rank of subsection and at the same time altered their epithets into plural adjectives, e.g. *Hypericum* sect. *Milleporum* Spach was called by him *Hypericum* sect. *Euhypericum* subsect. *Millepora*, and the taxon was attributed to Spach; there is a diagnosis. Boissier's name can be regarded either as a combination based on Spach's with the epithet misspelled or as a new name at a new rank. The publication either of a new combination or of a new name in the circumstances is in accordance with the rules, even although the sectional epithet is invalid. Here, such names are treated as new combinations with misspelled epithets.

HYPERICUM L.

HYPERICUM L., Sp. Pl. : 783 (1753); Gen. Pl., ed. 5 : 341 (1754). – Necker, Delic. Gallo-Belg. : 318 (1768) '*Hipericum*'. – J. F. Gmelin in L., Syst. Nat., ed. 13, 2 : 1156 (1791) '*Hypericon*'.

Sect. 1. *CAMPYLOSPORUS* (Spach) R. Keller

HYPERICUM sect. *CAMPYLOSPORUS* (Spach) R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 209 (1893); op. cit., ed. 2, 21 : 176 (1925).

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821); in DC., Prodr. 1 : 544 (1824) pro parte, quoad *H. lanceolatum* Lam., *H. angustifolium* Lam.

Hypericum sect. *Brathys* (Mutis ex L. f.) Choisy, op. cit. : 38, 58 (1821); in DC., tom. cit. : 553 (1824) pro parte, quoad *H. revolutum* Vahl.

Campylosporus Spach, Hist. Nat. Vég., Phan. 5 : 423 (1836); in Anns Sci. nat., sér. 2, Bot. 5 : 363 (1836). Type : *C. reticulatus* Spach, nom. superfl. (= *Hypericum lanceolatum* Lam.); lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 112 (1951).

Hypericum B. *Androsaemineae* h. *Campylosporus* (Spach) Endl., Gen. Pl. : 1033 (1840), status ignot.

Norysca sensu Blume, Mus. Bot. Lugd. Bat. 2 : 21 (1856) pro parte, quoad *N. lanceolata* (Lam.) Blume, *N. angustifolia* (Lam.) Blume, *N. madagascariensis* (Spach) Blume, non Spach.

Hypericum sect. *Norysca* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 209 (1893); op. cit., ed. 2, 21 : 176 (1925) pro parte, quoad *H. gnidiifolium* A. Rich., non *Norysca* Spach.

Type : *H. lanceolatum* Lam.

Distribution : Tropical and S.E. Africa, Socotra, Yemen, Arabia (Asir), Madagascar, Comoro Is., Réunion, Guatemala*, Mexico*.

10 species : *H. bequaertii* De Wild., *H. revolutum* Vahl (incl. *H. Keniense* Schweinf), *H. lanceolatum* Lam., *H. madagascariensis* (Spach) Steudel, *H. roeperanum* W. G. Schimper ex A. Rich., *H. quartinianum* A. Rich., *H. gnidiifolium* A. Rich., *H. synstylum* N. Robson, *H. socotranum* Good, *H. steyermarkii* Standley*.

* Further studies indicate that *H. steyermarkii*, from Guatemala and Mexico, constitutes a genus separate from *Hypericum*.

Basic chromosome number : unknown.*

Sect. 2. **PSOROPHYTUM** (Spach) Nyman

HYPERICUM sect. PSOROPHYTUM (Spach) Nyman, Consp. Fl. Eur. : 132 (1878).

Ascyrum Miller, Gard. Dict. Abridg., ed. 4, 1 (1754) pro parte, quoad sp. 2, non *Ascyrum* L. (1753).

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821) ; in DC., Prodr. 1 : 544 (1824) pro parte, quoad *H. balearicum* L.

Psorophytum Spach, Hist. Nat. Vég., Phan. 5 : 413 (1836) ; in Annls Sci. nat., sér. 2, Bot. 5 : 360 (1836). Type : *P. undulatum* Spach, nom. superfl. (\equiv *Hypericum balearicum* L.) ; holotype.

Hypericum B. *Androsaemineae* e. *Psorophytum* (Spach) Endl., Gen. Pl. : 1033 (1840), status ignot.

Type : *H. balearicum* L.

Distribution : Balearic Islands.

1 species : *H. balearicum* L.

Basic chromosome number : 12 (Nilsson & Lassen, 1971) ; ploidy $2 \times$.

Sect. 3. **ASCYREIA** Choisy

HYPERICUM sect. ASCYREIA Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821) ; in DC., Prodr. 1 : 544 (1824) excl. § 1 (Styli vulgo 3) et *H. alternifolium* Vahl, *H. pyramidatum* Aiton, *H. ascyron* L., *H. ascyroides* Willd., *H. rostratum* Raf., *H. lanceolatum* Lam., *H. angustifolium* Lam., *H. kalmianum* L., *H. balearicum* L. Type : *H. calycinum* L. ; lectotype.

Ascyrum Miller, Gard. Dict. Abridg., ed. 4, 1 (1754) quoad descr. sp. 1, excl. nom. Bauhin et sp. 2, non *Ascyrum* L. (1753). Type : *H. calycinum* L. ; lectotype.

Komana Adans., Fam. Pl. 2 : 444, 542 (1763). Type : *Hypericum* Miller, Gard. Dict., t. 151, f. 2 (\equiv *Hypericum monogynum* L.) ; holotype.

Norysca Spach, Hist. Nat. Vég., Phan. 5 : 426 (1836) ; in Annls Sci. nat., sér. 2, Bot. 5 : 363 (1836). Type : *N. chinensis* Spach (\equiv *H. chinense* L., non *H. chinense* Osb. \equiv *H. monogynum* L.) ; lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 97 (1951).

Eremanthe Spach, Hist. Nat. Vég., Phan. 5 : 421 (1836) ; in Annls Sci. nat., sér. 2, Bot. 5 : 363 (1836). Type : *E. calycina* (L.) Spach (\equiv *Hypericum calycinum* L.) ; holotype.

Komana subgen. *Centena* Raf., Fl. Tellur. 3 : 79 (1837). Type : *H. monogynum* L. ?

Hypericum B. *Androsaemineae* g. *Eremanthe* (Spach) Endl., Gen. Pl. : 1033 (1840), status ignot.

Hypericum B. *Androsaemineae* i. *Norysca* (Spach) Endl., loc. cit., status ignot.

Norysca sect. *Verae* Blume, Mus. Bot. Lugd. Bat. 2 : 22 (1856). Type : *N. chinensis* (L.) Spach (\equiv *H. monogynum* L.) ; lectotype.

Norysca sect. *Eremanthe* (Spach) Blume, tom. cit. : 23 (1856).

Hypericum sect. *Eremanthe* (Spach) Boiss., Fl. Orient. 1 : 785 (1867).

Hypericum subgen. *Norysca* (Spach) C. Koch, Dendrologie, 1 : 493 (1869) ? ex parte.

Hypericum sect. *Norysca* (Spach) R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 209 (1893) ; op. cit., ed. 2, 21 : 176 (1925) excl. *H. gnidiifolium* A. Rich., *H. formosanum* Maxim.

* Chromosome data are from Robson & Adams (1968) unless otherwise indicated.

Type : *H. calycinum* L.

Distribution : Turkey and S. Bulgaria, Pakistan, India and Ceylon to E. China, and south to Lombok and Celebes.

36 species : including *H. mysurense* Wight & Arn., *H. gaitii* Haines, *H. oblongifolium* Choisy, *H. calycinum* L., *H. griffithii* Hook. f. & Thomson ex Dyer, *H. monogynum* L., *H. prattii* Hemsley, *H. longistylum* Oliver, *H. cordifolium* Choisy, *H. reptans* Hook. f. & Thomson ex Dyer, *H. pachyphyllum* Collett & Hemsley, *H. augustinii* N. Robson, *H. lobbii* N. Robson, *H. gracilipes* Stapf ex C. E. C. Fischer, *H. tenuicaule* Hook. f. & Thomson ex Dyer, *H. uralum* Buch.-Ham. ex D. Don, *H. patulum* Thunb. ex Murray, *H. leschenaultii* Choisy, *H. choisianum* Wall. ex N. Robson, *H. hookerianum* Wight & Arn., *H. kouytchense* H. Lév., *H. wilsonii* N. Robson, *H. stellatum* N. Robson, *H. dyeri* Rehder, *H. pseudohenryi* N. Robson, *H. acmosepalum* N. Robson, *H. beanii* N. Robson, *H. forrestii* N. Robson, *H. bellum* Li.

Basic chromosome number : 12, 11 (Mehra & Sareen, 1969 ; *H. cernuum* Roxb. = *H. oblongifolium* Choisy), 10, 9 (cf. also Thomas, 1970) ; ploidy $2 \times$, $4 \times$.

Sect. 4. **TAKASAGOYA** (Y. Kimura) N. Robson

HYPERICUM sect. TAKASAGOYA (Y. Kimura) N. Robson in *Blumea* 20 : 252 (1973).

Hypericum sect. *Norysca* sensu R. Keller in Engler & Prantl, *Natürl. PflFam.*, ed. 2, 21 : 176 (1925) pro parte, quoad *H. formosanum* Maxim. ('formosum'), non R. Keller (1893).

Takasagoya Y. Kimura in *Bot. Mag.*, Tokyo 50 : 498 (1936). Type : *T. formosana* (Maxim.) Y. Kimura (= *Hypericum formosanum* Maxim.) ; holotype.

Type : *H. formosanum* Maxim.

Distribution : Taiwan, Philippines (Luzon).

4 species : *H. formosanum* Maxim., *H. nakamurai* (Masamune) N. Robson, *H. subalatum* Hayata, *H. geminiflorum* Hemsley.

Basic chromosome number : unknown.

Sect. 5. **ANDROSAEMUM** (Duhamel) Godron

HYPERICUM sect. ANDROSAEMUM (Duhamel) Godron in *Gren. & Godron, Fl. France* 1 : 320 (1847).

Androsaemum Miller, *Gard. Dict. Abridg.*, ed. 4, 1 (1754), *nom. nud.*

Androsaemum Duhamel, *Trait. Arb. Arbust.* 1 : 53 (1755). Type : *Hypericum androsaemum* L. ; holotype.

Hypericum sect. *Ascyreia* Choisy, *Prodr. Monogr. Hypér.* : 37, 38 (1821) ; in DC., *Prodr.* 1 : 544 (1824) pro parte, quoad *H. elatum* Aiton, *H. grandifolium* Choisy, *H. hircinum* L., *H. foliosum* Aiton.

Hypericum B. *Androsaemineae* f. *Androsaemum* (Duhamel) Endl., *Gen. Pl.* : 1033 (1840), *status ignot.*, excl. *H. inodorum* Willd.

Hypericum subgen. *Androsaemum* (Duhamel) C. Koch, *Dendrologie* 1 : 497 (1869), ? ex parte.

Hypericum sect. *Androsaemum* subsect. *Euandrosaemum* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 177 (1925). Type : *H. androsaemum* L. ; holotype.

Hypericum sect. *Androsaemum* subsect. *Pseudandrosaemum* R. Keller, op. cit. 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 177 (1925) excl. *H. concinnum* Benth., *H. inodorum* Willd. Type : *H. hircinum* L. ; lectotype.

Hypericum sect. *Webbia* R. Keller, op. cit. 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 177 (1925) pro parte, quoad *H. cambessedesii* Coss. ex Marès & Virgineix, non *Webbia* Spach.

Hypericum sect. *Siciliana* Bubani, Fl. Pyrenaea 3 : 343 (1901) nom. nud. Type : *H. bacciforme* Bubani (\equiv *H. androsaemum* L.) ; holotype.

Hypericum sect. *Pseudandrosaemum* (R. Keller) Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 143 (1933) ('*Pseudoandrosaemum*') excl. *H. concinnum* Benth.

Type : *H. androsaemum* L.

Distribution : Macaronesia, W. Europe, Mediterranean to Iran, Arabia (Asir).

4 species : *H. grandifolium* Choisy, *H. foliosum* Aiton, *H. hircinum* L., *H. androsaemum* L.

Basic chromosome number : 10 ; ploidy 4x.

Sect. 6. **INODORA** Stef.

HYPERICUM sect. INODORA Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 147 (1933) '*Inodorum*'. Type : *H. inodorum* Willd. non *H. inodorum* Miller (\equiv *H. xylosteifolium* (Spach) N. Robson) ; holotype.

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821) ; in DC., Prodr. 1 : 544 (1824) pro parte, quoad *H. inodorum* Willd.

Androsaemum sensu Spach, Hist. Nat. Vég., Phan. 5 : 414 (1836) ; in Anns Sci. nat., sér. 2, Bot. 5 : 360 (1836) pro parte, quoad *A. xylosteifolium* Spach, non Duhamel.

Hypericum B. *Androsaemineae* f. *Androsaemum* Endl., Gen. Pl. : 1033 (1840), status ignot., pro parte, quoad *H. inodorum* Willd., non *Androsaemum* Duhamel.

Hypericum sect. *Androsaemum* sensu Boiss., Fl. Orient. 1 : 785 (1867) pro parte, quoad *H. inodorum* Willd.

Hypericum sect. *Androsaemum* subsect. *Pseudandrosaemum* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 177 (1925) pro parte, quoad *H. inodorum* Willd.

Type : *H. xylosteifolium* (Spach) N. Robson.

Distribution : South-eastern Pontic region (Turkey, U.S.S.R.).

1 species : *H. xylosteifolium* (Spach) N. Robson (*H. inodorum* Willd. non *H. inodorum* Miller).

Basic chromosome number : 10, ploidy 4x.

Sect. 7. **ROSCYNA** (Spach) R. Keller

HYPERICUM sect. ROSCYNA (Spach) R. Keller in Engl. & Prantl, Natürl. PflFam. 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 176 (1925).

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821) ; in DC., Prodr. 1 : 544 (1824) pro parte, quoad *H. ascyroides* Willd., *H. pyramidatum* Aiton, *H. ascyron* L.

Ascyrum sensu Poirét in Lam., Tabl. Encycl. Méth., Bot. 3 : 199, t. 642, f. 3 (1823) pro parte, quoad *A. sibiricum* Poirét, non L.

Roscyna Spach, Hist. Nat. Vég., Phan. 5 : 429 (1836); in Annls Sci. nat., sér. 2, Bot. 5 : 364 (1836). Type: *R. gmelinii* Spach, *nom. superfl.* (\equiv *Hypericum ascyron* L.); lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 118 (1951).

Hypericum B. *Androsaemineae* k. *Roscyna* (Spach) Endl., Gen. Pl. : 1033 (1840), *status ignot.*

Hypericum subgen. *Roscyna* (Spach) Turczj. in Bull. Soc. Nat. Moscow, 15 : 620 (1842) '*Roseyna*' ? ex parte.

Type: *H. ascyron* L.

Distribution: Altai to Yunnan and Japan; N.E. America.

3-4 species: *H. elatoides* R. Keller, *H. przewalskii* Maxim., *H. ascyron* L.; also *H. pedunculatum* R. Keller ?

Basic chromosome number : 9; ploidy $2 \times$.

Sect. 8. **BUPLEUROIDES** Stef.

HYPERICUM sect. BUPLEUROIDES Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 160 (1933). Type: *H. bupleuroides* Griseb.; holotype.

Hypericum sect. *Euhypericum* subsect. *Taeniocarpium* sensu Boiss., Fl. Orient. 1 : 787 (1867) '*Taeniocarpia*' pro parte, quoad *H. bupleuroides* Griseb., non *Hypericum* sect. *Taeniocarpium* Jaub. & Spach.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 212 (1893); op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. bupleuroides* Griseb.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Bupleuroidea* Gorschk. in Shishkin & Bobrov, Fl. U.S.S.R. 15 : 246 (1949), *sine descr. lat.*

Type: *H. bupleuroides* Griseb.

Distribution: South-eastern Pontic region (Turkey, U.S.S.R.).

1 species: *H. bupleuroides* Griseb.

Basic chromosome number : unknown.

Sect. 9. **HYPERICUM**

HYPERICUM sect. HYPERICUM, sectio typicum generis.

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821); in DC., Prodr. 1 : 546 (1824) excl. parte, quoad *H. micranthum* Choisy, *H. punctatum* Lam., *H. quadrangulum* L., *H. attenuatum* Choisy, *H. erectum* Thunb., *H. crispum* L., *H. afrum* Lam., *H. perforatum* L., *H. kohlianum* Sprengel, *H. elegans* Stephan ex Willd. Type: *H. perforatum* L.; lectotype.

Hypericum sect. *Holosepalum* Spach in Annls Sci. nat., sér. 2, Bot. 5 : 357 (1836) excl. parte, quoad *H. crispum* L., *H. quadrangulum* L., *H. tetrapterum* Fries, *H. undulatum* Schousboe ex Willd., *H. punctatum* Lam. Type: *H. tetrapterum* Fries; lectotype.

Hypericum sect. *Milleporum* Spach, loc. cit. (1836). Type: *H. perforatum* L.; holotype.

Hypericum sect. *Adenosepalum* Spach, loc. cit. (1836) pro parte, quoad *H. elegans* Stephan ex Willd., *H. formosum* Kunth.

- Hypericum* A. *Hyperineae* b. *Hypericum* α *Holosepalum* (Spach) Endl., Gen. Pl. : 1032 (1840), *status ignot.*, excl. *H. humifusum* L., *H. nanum* Poiret, *H. cuneatum* Poiret, *H. heterophyllum* Vent.
- Hypericum* A. *Hyperineae* b. *Hypericum* β *Milleporum* (Spach) Endl., loc. cit. (1840), *status ignot.*
- Hypericum* A. *Hyperineae* b. *Hypericum* γ *Adenosepalum* Endl., loc. cit. (1840), *status ignot.*, pro parte, quoad *H. elegans* Stephan ex Willd., *H. formosum* Kunth, non *Hypericum* sect. *Adenosepalum* Spach.
- Hypericum* sect. *Taeniocarpium* Jaub. & Spach, Ill. Pl. Orient. 1 : 47 (1842) pro parte, quoad *H. anagallidioides* Jaub. & Spach, *H. elegans* Stephan ex Willd.
- Hypericum* sect. *Euhypericum* Godron in Gren. & Godron, Fl. France, 1 : 314 (1847), *nom. invalid.*, excl. parte, quoad *H. perforatum* L., *H. quadrangulum* L., *H. tetrapterum* Fries, *H. corsicum* Steudel. Type : *H. perforatum* L. ; lectotype.
- Hypericum* sect. *Euhypericum* subject. *Taeniocarpium* (Jaub. & Spach) Boiss., Fl. Orient. 1 : 787 (1867) '*Taeniocarpia*' pro parte, quoad *H. elegans* Stephan ex Willd., *H. tetrapterum* Fries, *H. crispum* L., non *Hypericum* sect. *Taeniocarpium*, Jaub. & Spach. – Nyman, Consp. Fl. Eur. 1 : 132 (1878) '*Hypericum*' pro nom. sect., pro parte, quoad *H. elegans* Stephan ex Willd., *H. undulatum* Schousboe ex Willd., *H. tetrapterum* Fries, *H. quadrangulum* L., *H. perforatum* L., *H. crispum* L.
- Hypericum* sect. *Euhypericum* subject. *Milleporum* (Spach) Boiss., loc. cit. '*Millepora*' excl. parte, quoad *H. perforatum* L.
- Holosepalum* (Spach) Fourr. in Anns Soc. linn. Lyon, nouv. sér. 16 : 352 (1868) excl. *H. humifusum* (L.) Fourr.
- Hypericum* sect. *Androsaemum* subject. *Pseudandrosaemum* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 177 (1925) pro parte, quoad *H. concinnum* Benth.
- Hypericum* sect. *Euhypericum* subject. *Homotaenium* R. Keller, op. cit. 3 (6) : 212 (1893) ; op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. afrum* Lam., *H. attenuatum* Choisy, *H. quadrangulum* L. *H. tetrapterum* Fries, *H. crispum* L., *H. corymbosum* Michaux, *H. scouleri* Hook., *H. elegans* Stephan ex Willd., *H. boeticum* Boiss., *H. undulatum* Schousboe ex Willd., *H. formosum* Kunth, *H. procumbens* R. Keller, non Michaux, *H. petiolatum* Hook f. & Thoms. ('*petiolatum*'), *H. pseudopetiolatum* R. Keller, *H. faberi* R. Keller ex Hand.-Mazz., *H. oaxacum* R. Keller, *H. seleri* R. Keller, *H. desetangii* Lamotte, *H. acutum* Moench, *H. erectum* Thunb., *H. mutiloides* R. Keller, *H. mororanense* R. Keller ('*morarense*'), *H. otaruense* R. Keller, *H. wichurae* R. Keller, *H. kamtschaticum* Ledeb., *H. graveolens* Buckley, *H. simulans* Rose, *H. hakonense* Franchet & Savat.
- Hypericum* sect. *Euhypericum* subject. *Heterotaenium* R. Keller, op. cit. 3 (6) : 213 (1893) ; op. cit., ed. 2, 21 : 180 (1925) excl. parte, quoad *H. perforatum* L., *H. noeanum* Boiss. Type : *H. perforatum* L. ; lectotype.
- Hypericum* sect. *Caulopteron* Acloque, Fl. France : 173 (1894) excl. *H. ciliatum* Lam., *H. humifusum* L. Type : *H. perforatum* L. ; lectotype.
- Hypericum* sect. *Euhypericum* subject. *Drosocarpium* sensu R. Keller, op. cit., ed. 2, 21 : 180 (1925) pro parte, quoad *H. oshimaense* R. Keller, *H. electrocarpum* Maxim., *H. sampsonii* Hance, non Boiss.
- Hypericum* sect. *Brathys* subject. *Eubrathys* sensu R. Keller, tom. cit. : 181 (1925) pro parte, quoad *H. epigeium* R. Keller, non R. Keller (1893).
- Hypericum* sect. *Brathys* subject. *Spachium* sensu R. Keller, tom. cit. : 181 (1925) pro parte, quoad *H. collinum* Schlecht. & Cham., non R. Keller (1893).
- Hypericum* sect. *Pseudandrosaemum* Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 143 (1933) '*Pseudoandrosaemum*' pro parte, quoad *H. concinnum* Benth., non *Hypericum* subject. *Pseudandrosaemum* R. Keller.
- Hypericum* sect. *Perforata* Stef., tom. cit. : 174 (1933) excl. *H. tomentosum* L., *H. lusitanicum* Poiret, *H. pubescens* Boiss. Type : *H. perforatum* L. ; lectotype.
- Hypericum* sect. *Euhypericum* subject. *Drosocarpium* sensu Y. Kimura in Bot. Mag. Tokyo 54 : 86 (1940) pro parte, quoad *H. sampsonii* Hance, non R. Keller.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Attenuata* Gorschk. in Shishkin & Bobrov, Fl. U.S.S.R. 15 : 236 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Kamtschatica* Gorschk., tom. cit. : 237 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Acuta* Gorschk., tom. cit. : 241 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Quadrangula* Gorschk., tom. cit. : 242 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Elegantia* Gorschk., tom. cit. : 243 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Crispa* Gorschk., tom. cit. : 244 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Heterotaenium* series *Perforata* Gorschk., tom. cit. : 247 (1949), *sine descr. lat.*

Hypericum sect. *Drosocarpium* sensu Y. Kimura in Nakai & Honda, Nova Fl. Jap 10 : 127 (1951) pro parte, quoad *H. sampsonii* Hance, non Spach.

Hypericum sect. *Homotaenium* Y. Kimura, tom. cit. : 135 (1951) pro parte, non *Hypericum* subsect. *Homotaenium* R. Keller.*

Hypericum sect. *Homotaenium* series *Quadrangula* Y. Kimura, tom. cit. : 136 (1951). Type : *H. quadrangulum* L., *nom. ambig.* (= *H. tetrapterum* Fries); holotype.

Hypericum sect. *Homotaenium* series *Crispa* Y. Kimura, loc. cit. (1951). Type : *H. crispum* L. (= *H. triquetrifolium* Turra); holotype.

Hypericum sect. *Homotaenium* series *Bilineata* Y. Kimura, loc. cit. (1951) et greges. Type : *H. attenuatum* Choisy; holotype.

Hypericum sect. *Homotaenium* series *Elineata* Y. Kimura, loc. cit. (1951) et greges. Type : *H. erectum* Thunb. ex Murray.

Hypericum sect. *Pulogensia* N. Robson in Blumea 20 : 259 (1973) pro parte, quoad spp. Taiwanianae.

Type : *H. perforatum* L.

Distribution : North temperate zone and southward to Guatemala, the Sudan Republic (? introduced), Sabah and Sumatra. *H. perforatum* L. introduced into several other parts of the world.

About 48 species : including *H. concinnum* Benth., *H. maculatum* Crantz, *H. tetrapterum* Fries, *H. undulatum* Schousboe ex Willd., *H. afrum* Lam., *H. perforatum* L., *H. triquetrifolium* Turra, *H. attenuatum* Choisy, *H. elegans* Stephan ex Willd., *H. yezoense* Maxim., *H. tosaense* Makino, *H. nagasawai* Hayata, *H. taiwanianum* Y. Kimura, *H. nokoense* Ohwi; *H. yamamotoi* Miyabe & Y. Kimura, *H. samaniense* Miyabe & Y. Kimura, *H. oliganthum* Franchet & Savat., *H. ovalifolium* Koidz., *H. kamtschaticum* Ledeb., *H. hakonense* Franchet & Savat., *H. sikokumontanum* Makino, *H. kiusianum* Koidz., *H. penthorodes* Koidz., *H. yakusimense* Koidz., *H. vulcanicum* Koidz., *H. erectum* Thunb. ex Murray, *H. kinashianum* Koidz., *H. seniawinii* Maxim., *H. faberi* R. Keller ex Hand.-Mazz., *H. petiolulatum* Hook. f. & Thomson ex Dyer, *H. pseudopetiolum* R. Keller, *H. sampsonii* Hance, *H. graveolens* Buckley, *H. mitchellianum* Rydb., *H. punctatum* Lam., *H. pseudomaculatum* Bush, *H. seleri* R. Keller, *H. scouleri* Hook., *H. formosum* Kunth, *H. oaxacum* R. Keller, *H. epigeium* R. Keller, *H. collinum* Schlecht. & Cham.

Basic chromosome number : 9 (Hsu, 1968), 8, 7; ploidy 2 \times , 4 \times , 5 \times , 6 \times .

* Y. Kimura cites *H. erectum* Thunb. as the type of this section, but this species was not included by R. Keller (1893) in his subsection.

Sect. 10. **OLYMPIA** (Spach) Nyman

HYPERICUM sect. OLYMPIA (Spach) Nyman, Consp. Fl. Eur. : 132 (1878) excl. *H. apollinis* Boiss. & Heldr.

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37 (1821); in DC., Prodr. 1 : 544 (1824) pro parte, quoad *H. olympicum* L.

Olympia Spach, Hist. Nat. Vég., Phan. 5 : 406 (1836); in Annls Sci. nat., sér. 2, Bot. 5 : 359 (1836). Type : *O. glauca* Spach, nom. superfl. (= *Hypericum olympicum* L.); holotype.

Hypericum A. *Hyperineae* c. *Olympia* (Spach) Endl., Gen. Pl. : 1033 (1840), status ignot.

Hypericum sect. *Euhypericum* subsect. *Olympia* (Spach) Boiss., Fl. Orient. 1 : 786 (1867), excl. *H. apollinis* Boiss. & Heldr.

Type : *H. olympicum* L.

Distribution : South Balkan Peninsula, western Turkey; Caucasus?

2 species : *H. olympicum* L., *H. polyphyllum* Boiss. & Balansa.

Basic chromosome number : 9; ploidy 2x.

Sect. 11. **CAMPYLOPUS** Boiss.

HYPERICUM sect. CAMPYLOPUS Boiss., Fl. Orient. 1 : 785 (1867).

Campylopus Spach, Hist. Nat. Vég., Phan. 5 : 411 (1836); in Annls Sci. nat., sér. 2, Bot. 5 : 360 (1836), non *Campylopus* Brid. (1819). Type : *C. cerastoides* Spach (= *Hypericum cerastoides* (Spach) N. Robson = *H. rhodoppeum* Frivald.); holotype.

Campylopelma Reichenb., Handb. Nat. Pflanzensyst. : 307 (1837) = *Campylopus* Spach non Brid.

Hypericum B. *Androsaemineae* d. *Campylopus* Endl., Gen. Pl. : 1033 (1840), status ignot.

Type : *H. cerastoides* (Spach) N. Robson.

Distribution : North-eastern Aegean region.

1 species : *H. cerastoides* (Spach) N. Robson.

Basic chromosome number : 8; ploidy 2x.

Sect. 12. **ORIGANIFOLIA** Stef.

HYPERICUM sect. ORIGANIFOLIA Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 166 (1933) excl. *H. trichocaulon* Boiss. & Heldr. Type : *H. origanifolium* Willd., lectotype.

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821); in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. origanifolium* Willd.

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

Hypericum sect. *Drosocarpium* sensu Jaub. & Spach, tom. cit. : 35 (1842) pro parte, quoad *H. origanifolium* Willd., non Spach.

Hypericum sect. *Euhypericum* subsect. *Milleporum* Boiss., Fl. Orient. 1 : 787 (1867) 'Millepora' pro parte, excl. *H. perforatum* L., *H. ciliatum* Lam., non *Hypericum* sect. *Milleporum* Spach.

Hypericum sect. *Euhypericum* subsect. *Heterotaenium* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 213 (1893); op. cit., ed. 2, 21 : 180 (1925) pro parte, excl. *H. perforatum* L., *H. ciliatum* Lam.

Hypericum sect. *Uniflora* Stef., tom. cit. : 168 (1933). Type : *H. uniflorum* Boiss. & Heldr. (= *H. aviculariifolium* subsp. *uniflorum* (Boiss. & Heldr.) N. Robson); holotype.

Hypericum sect. *Euhypericum* subsect. *Heterotaenium* series *Origanifolia* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S. 15 : 247 (1949), *sine descr. lat.*

Type : *H. origanifolium* Willd.

Distribution : Turkey, U.S.S.R. (Georgia).

4 species : *H. origanifolium* Willd., *H. aviculariifolium* Jaub. & Spach, *H. salsugineum* Robson & Huber-Mor., *H. imbricatum* Poulter.

Basic chromosome number : 9 ; ploidy 2x.

Sect. 13. **DROSOCARPIUM** Spach

HYPERICUM sect. DROSOCARPIUM Spach in Annls Sci. nat., sér. 2, Bot. 5 : 358 (1836). Type : *H. barbatum* Jacq.; lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 127 (1951).

Ascyrum Miller, Gard. Dict. abridg., ed. 4, 1 (1754) pro parte, quoad *A. magno flore* C.B.P., excl. descr., non *Ascyrum* L. (1753).

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821); in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. barbatum* Jacq., *H. dentatum* Loisel., *H. fimbriatum* Lam., *H. ciliatum* Lam.

Hypericum A. *Hyperineae* δ *Drosocarpium* (Spach) Endl., Gen. Pl. : 1033 (1840), *status ignot.*

Hypericum sect. *Euhypericum* Godron in Gren. & Godron, Fl. France 1 : 314 (1847), *nom. invalid.*, pro parte, quoad *H. richeri* Vill., *H. burseri* DC., *H. ciliatum* Lam.

Hypericum sect. *Euhypericum* subsect. *Olympia* Boiss., Fl. Orient. 1 : 786 (1867) pro parte, quoad *H. apollinis* Boiss. & Heldr., non *Olympia* Spach.

Hypericum sect. *Euhypericum* subsect. *Milleporum* Boiss., tom. cit. : 787 (1867) '*Millepora*', pro parte, quoad *H. ciliatum* Lam., *H. trichocaulon* Boiss. & Heldr., non *Hypericum* sect. *Milleporum* Spach.

Hypericum sect. *Euhypericum* subsect. *Drosocarpium* (Spach) Boiss., tom. cit. : 788 (1867) '*Drosocarpia*' - Nyman, Consp. Fl. Eur. : 132 (1878) '*Hypericum*' pro nom. sect.

Drosocarpium (Spach) Fourr. in Annls Soc. linn. Lyon, nouv. sér. 16 : 353 (1868). - R. Keller in Engler & Prantl, Natürl. PflFam. ed. 2, 21 : 180 (1925) excl. *H. oshimaense* R. Keller, *H. electrocarpum* Maxim., *H. sampsonii* Hance.

Hypericum sect. *Euhypericum* subsect. *Taeniocarpium* sensu Nyman, loc. cit. (1878) '*Taeniocarpia*', '*Hypericum*' pro nom. sect., pro parte, quoad *H. perfoliatum* L., *H. trichocaulon* Boiss. & Heldr., non Boiss.

Hypericum sect. *Euhypericum* subsect. *Heterotaenium* R. Keller, op. cit. 3 (6) : 213 (1893); op. cit., ed. 2, 21 : 180 (1925) pro parte, quoad *H. ciliatum* Lam., *H. boissieri* Petrović, *H. trichocaulon* Boiss. & Heldr.

Hypericum sect. *Kelleria* Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 161 (1933). Type : *H. kelleri* Baldacci; holotype.

Hypericum sect. *Origanifolia* Stef., tom. cit. : 166 (1933) pro parte, quoad *H. trichocaulon* Boiss. & Heldr.

Hypericum sect. *Euhypericum* subsect. *Drosocarpium* series *Nordmanniana* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S. 15 : 253 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Drosocarpium* series *Caucasica* Gorschk., tom. cit. : 254 (1949), *sine descr. lat.*

Type : *H. barbatum* Jacq.

Distribution : Madeira, Mediterranean region, Pyrenees, Alps, Balkans, Levant, Pontus, U.S.S.R. (Georgia).

About 12 species : *H. vesiculosum* Griseb., *H. perforiatum* L., *H. montbretii* Spach, *H. umbellatum* A. Kerner, *H. bithynicum* Boiss., *H. richeri* Vill., *H. spruneri* Boiss., *H. rochelii* Griseb. & Schenk, *H. barbatum* Jacq., *H. rumeliacum* Boiss., *H. trichocaulon* Boiss. & Heldr., *H. kelleri* Baldacci ; also *H. setiferum* Stef. ?

Basic chromosome numbers : 8 (Contandriopoulos & Lanzalavi, 1968), 7 ; ploidy $2\times$, $4\times$.

Sect. 14. **OLIGOSTEMA** (Boiss.) Stef.

HYPERICUM sect. OLIGOSTEMA (Boiss.) Stef. in God. Agr.-les. Fak. Univ. Sofiya II : 158 (1933).

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821) ; in DC., Prodr. I : 546 (1824) pro parte, quoad *H. repens* L., *H. humifusum* L., *H. linarifolium* Vahl.

Hypericum sect. *Holosepalum* Spach in Anns Sci. nat., sér. 2, Bot. 5 : 357 (1836) pro parte, quoad *H. humifusum* L.

Hypericum sect. *Adenosepalum* Spach, loc. cit. (1836) pro parte, quoad *H. linarifolium* Vahl '*linearifolium*'.

Hypericum A. Hyperineae b. *Hypericum* α *Holosepalum* Endl., Gen. Pl. : 1032 (1840), status ignot., pro parte, quoad *H. humifusum* L., non *Hypericum* sect. *Holosepalum* Spach.

Hypericum A. Hyperineae b. *Hypericum* γ *Adenosepalum* Endl., loc. cit. (1840), status ignot., pro parte, quoad *H. linarifolium* '*linearifolium*', non *Hypericum* sect. *Adenosepalum* Spach.

Hypericum sect. *Taenioarpium* Jaub. & Spach, Ill. Pl. Orient. I : 47 (1842) pro parte, quoad *H. linarifolium* Vahl '*linearifolium*', *H. australe* Ten., *H. aucheri* Jaub. & Spach.

Hypericum sect. *Euhypericum* Godron in Gren. & Godron, Fl. France I : 314 (1847), nom. invalid., pro parte, quoad *H. humifusum* L.

Hypericum sect. *Euhypericum* subsect. *Oligostema* Boiss., Fl. Orient. I : 786 (1867). — Nyman, Consp. Fl. Eur. : 134 (1878) '*Oligostemata*', '*Hypericum*' pro nom. sect. Type : *H. humifusum* L. ; holotype.

Hypericum sect. *Euhypericum* subsect. *Taenioarpium* Boiss., tom. cit. : 787 (1867) '*Taenioarpia*', pro parte, quoad *H. aucheri* Jaub. & Spach, non *Hypericum* sect. *Taenioarpium* Jaub. & Spach. — Nyman, op. cit. : 132 (1878) '*Hypericum*' pro nom. sect., pro parte, quoad *H. australe* Ten.

Holosepalum Fourr. in Anns Soc. linn. Lyon, nouv. sér. 16 : 352 (1868) pro parte, quoad *H. humifusum* (L.) Fourr., non *Hypericum* sect. *Holosepalum* Spach.

Hypericum sect. *Hypericum* subsect. *Coridium* sensu Nyman. op. cit. : 134 (1878) '*Coridia*' pro parte, quoad *H. linarifolium* Vahl, non Boiss.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 212 (1893) ; op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. australe* Ten., *H. linarifolium* Vahl '*linearifolium*', *H. tenellum* Janka.

Hypericum sect. *Acaulopteron* Acloque, Fl. France : 173 (1894) pro parte, quoad *H. australe* Ten., *H. linarifolium* Vahl.

Hypericum sect. *Caulopteron* Acloque, loc. cit. (1894) pro parte, quoad *H. humifusum* L.

Hypericum sect. *Euhypericum* subsect. *Triadenioides* sensu R. Keller, op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. modestum* Boiss., non Boiss.

Hypericum sect. *Modesta* Stef., tom. cit. : 161 (1933). Type : *H. modestum* Boiss. ; holotype.

Hypericum sect. *Montana* Stef., tom. cit. : 162 (1933) pro parte, quoad *H. linarifolium* Vahl, *H. australe* Ten., *H. aucheri* Jaub. & Spach.

Hypericum sect. *Euhypericum* subsect. *Oligostema* series *Humifusa* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S. 15 : 219 (1949), sine descr. lat., excl. parte, quoad *H. humifusum* L.

Type : *H. humifusum* L.

Distribution : Macaronesia, Europe, Mediterranean region.

7 species : *H. aucheri* Jaub. & Spach, *H. repens* L., *H. australe* Ten., *H. linari-folium* Vahl, *H. humifusum* L., *H. andjerinum* Font Quer & Pau, *H. modestum* Boiss.

Basic chromosome number : 8 ; ploidy $2 \times$.

Sect. 15. **THASIA** Boiss.

HYPERICUM sect. THASIA Boiss., Fl. Orient. 1 : 785 (1867). – R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 209 (1893) ; op. cit., ed. 2, 21 : 176 (1925) ‘*Thasium*’. *Type* : *H. thasium* Griseb. ; holotype.

Type : *H. thasium* Griseb.

Distribution : South-eastern Balkan Peninsula, Thasos.

1 species : *H. thasium* Griseb.

Basic chromosome number : unknown.

Sect. 16. **CROSSOPHYLLUM** Spach

HYPERICUM sect. CROSSOPHYLLUM Spach in Anns Sci. nat., sér. 2, Bot. 5 : 359 (1836). *Type* : *H. ptarmicifolium* Spach, ‘*ptarmicaefolium*’ (\equiv *H. orientale* L.) ; lectotype.

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821) ; in DC., Prodr. 1 : 546 (1842) pro parte, quoad *H. orientale* L.

Hypericum A. *Hyperineae* b. *Hypericum* ζ *Crossophyllum* (Spach) Endl., Gen. Pl. : 1033 (1840), status ignot.

Hypericum sect. *Euhypericum* subsect. *Crossophyllum* (Spach) Boiss., Fl. Orient. 1 : 786 (1867) ‘*Crossophylla*’.

Hypericum sect. *Euhypericum* subsect. *Crossophyllum* series *Ptarmicifolia* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S. 15 : 222 (1949), sine descr. lat.

Type : *H. orientale* L.

Distribution : North and west Turkey, Caucasus.

2 species : *H. orientale* L., *H. adenotrichum* Spach.

Basic chromosome number : 8 ; ploidy $2 \times$.

Sect. 17. **HIRTELLA** Stef.

HYPERICUM sect. HIRTELLA Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 183 (1933). *Type* : *H. hirtellum* (Spach) Boiss. ; lectotype.

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821) ; in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. hyssopifolium* Vill. (excl. var. *pauciglandulosum* Choisy ?), *H. capitatum* Choisy, *H. scabrum* L., *H. triplinerve* Vent.

- Eremosporus* Spach, Hist. Nat. Vég., Phan. 5 : 374 (1836) ; in Annls Sci. nat., sér. 2, Bot. 5 : 355 (1836). Type : *E. olivieri* Spach (\equiv *Hypericum olivieri* (Spach) Boiss.) ; holotype.
- Drosanthe* Spach, Hist. Nat. Vég., Phan. 5 : 376 (1836) ; in Annls Sci. nat., sér. 2, Bot. 5 : 355 (1836). Type : *D. hirtella* Spach (\equiv *Hypericum hirtellum* (Spach) Boiss.) ; lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 113 (1951).
- Hypericum* sect. *Adenosepalum* Spach in Annls Sci. nat., sér. 2, Bot. 5 : 357 (1836) pro parte, quoad *H. hyssopifolium* Vill., *H. triplinerve* Vent.
- Hypericum* a. *Drosanthineae* a. *Eremosporus* (Spach) Endl., Gen. Pl. : 1032 (1840), *status ignot.*
- Hypericum* a. *Drosanthineae* b. *Drosanthe* (Spach) Endl., loc. cit. (1840), *status ignot.*
- Hypericum* A. *Hyperineae* b. *Hypericum* γ *Adenosepalum* Endl., loc. cit. (1840), *status ignot.*, pro parte, quoad *H. hyssopifolium* Vill., *H. triplinerve* Vent., non *Hypericum* sect. *Adenosepalum* Spach.
- Hypericum* sect. *Taeniocarpium* Jaub. & Spach, Ill. Pl. Orient. 1 : 47 (1842) pro parte, quoad *H. hyssopifolium* Vill. var. *hyssopifolium*, *H. retusum* Aucher-Eloy ex Jaub. & Spach, *H. asperulum* Jaub. & Spach.
- Thymopsis* Jaub. & Spach, tom. cit. : 72 (1842). Type : *T. aspera* Jaub. & Spach (\equiv *Hypericum thymopsis* Boiss.) ; holotype.
- Hypericum* sect. *Euhypericum* Godron in Gren. & Godron, Fl. France 1 : 314' (1847), *nom invalid.*, pro parte, quoad *H. hyssopifolium* Vill.
- Hypericum* sect. *Euhypericum* subsect. *Taeniocarpium* (Jaub. & Spach) Boiss., Fl. Orient. 1 : 787 (1867) '*Taeniocarpia*' pro parte, quoad *H. scabrum* L., *H. laeve* Boiss. & Hausskn., *H. thymopsis* Boiss., *H. hirtellum* (Spach) Boiss., *H. assyriacum* Boiss., *H. hyssopifolium* Vill., *H. callianthum* Boiss. & Noé, *H. helianthemoides* (Spach) Boiss., *H. adenocladum* Boiss., *H. olivieri* (Spach) Boiss., *H. leptocladum* Boiss., *H. retusum* Aucher, *H. amanum* Boiss., *H. spectabile* Jaub. & Spach, non *Hypericum* sect. *Taeniocarpium* Jaub. & Spach - Nyman, Consp. Fl. Eur. : 132 (1878) '*Hypericum*' pro nom. sect., pro parte, quoad *H. hyssopifolium* Vill.
- Hypericum* sect. *Euhypericum* subsect. *Homotaenium* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 212 (1893) ; op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad spec. Boiss. supra cit.
- Hypericum* sect. *Acaulopteron* Acloque, Fl. France : 173 (1894) pro parte, quoad *H. hyssopifolium* Vill.
- Hypericum* sect. *Pulchra* Stef., tom. cit. : 177 (1933) pro parte, quoad *H. amanum* Boiss., *H. nabelekii* Stef.
- Hypericum* sect. *Hyssopifolia* Stef., tom. cit. : 178 (1933), excl. *H. hirsutum* L., *H. kotschyannum* Boiss., *H. confertum* Choisy, *H. neurocalycinum* Boiss. & Heldr., *H. pruinatum* Boiss. & Balansa, *H. armenum* Jaub. & Spach, *H. theodorii* Woronow, *H. alpestre* Steven. Type : *H. hyssopifolium* Vill. ; lectotype.
- Hypericum* sect. *Spectabiles* Stef., tom. cit. : 182 (1933). Type : *H. spectabile* Jaub. & Spach ; lectotype.
- Hypericum* sect. *Scabra* Stef., tom. cit. : 185 (1933). Type : *H. scabrum* L. ; holotype.
- Hypericum* sect. *Euhypericum* subsect. *Homotaenium* series *Scabra* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S. 15 : 224 (1949), *sine descr. lat.*
- Hypericum* sect. *Euhypericum* subsect. *Homotaenium* series *Pontica* Gorschk., tom. cit. : 228 (1949) *sine descr. lat.*
- Hypericum* sect. *Euhypericum* subsect. *Homotaenium* series *Helianthemoides* Gorschk., tom. cit. : 229 (1949), *sine descr. lat.*
- Hypericum* sect. *Euhypericum* subsect. *Homotaenium* series *Elongata* Gorschk., tom. cit. : 230 (1949), *sine descr. lat.*
- Hypericum* sect. *Drosanthe* (Spach) Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 113 (1951).

Type : *H. hirtellum* (Spach) Boiss.

Distribution : Mediterranean, Turkey, Crimea, Iraq, Caucasus to Altai Mts.

24 species: including *H. elongatum* Ledeb., *H. apricum* Karelín & Kiril., *H. uniglandulosum* Hausskn. ex Bornm., *H. salsolifolium* Hand.-Mazz., *H. hysso-pifolium* Vill., *H. lydi-um* Boiss., *H. amblysepalum* Hochst., *H. spectabile* Jaub. & Spach, *H. lysimachioides* Boiss. & Noé, *H. asperulum* Jaub. & Spach, *H. hirtellum* (Spach) Boiss., *H. retusum* Aucher-Eloy, *H. libanoticum* N. Robson, *H. pseudolaeve* N. Robson, *H. thymbrifolium* Boiss. & Noé, *H. helianthemoides* (Spach) Boiss., *H. vermiculare* Boiss. & Hausskn., *H. olivieri* (Spach) Boiss., *H. capitatum* Choisy, *H. scabroides* Robson & Poulter, *H. scabrum* L., *H. thymopsis* Boiss.

Basic chromosome number: 8 (Reynaud, 1973); ploidy $3 \times ?^*$

Sect. 18. *TAENIOCARPIUM* Jaub. & Spach

Hypericum sect. *TAENIOCARPIUM* Jaub. & Spach, Ill. Pl. Orient. 1: 47 (1842) excl. parte, quoad *H. repens* sensu Jaub. & Spach, *H. satyriifolium* Jaub. & Spach, *H. hysso-pifolium* var. *hirtellum* Jaub. & Spach. Type: *H. repens* sensu Jaub. & Spach (= *H. linarioides* Bosse); lectotype, see N. Robson in Notes R. Bot. Gdn. Edinb. 27: 194 (1967).

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér.: 37, 44 (1821); in DC., Prodr. 1: 546 (1824) pro parte, quoad *H. hirsutum* L., *H. nummularium* L., *H. pulchrum* L., *H. serpyllifolium* Lam., *H. confertum* Choisy.

Hypericum sect. *Adenosepalum* Spach in Annl. Sci. nat., sér. 2, Bot. 5: 357 (1836) pro parte, quoad *H. serpyllifolium* Lam., *H. pulchrum* L., *H. nummularium* L.

Hypericum A. *Hyperineae* b. *Hypericum* γ *Adenosepalum* Endl., Gen. Pl.: 1032 (1840), status ignot., pro parte, quoad *H. serpyllifolium* Lam., *H. pulchrum* L., *H. nummularium* L., non *Hypericum* sect. *Adenosepalum* Spach.

Hypericum sect. *Helianthemoides* Jaub. & Spach, tom. cit.: 65 (1842). Type: *H. armenum* Jaub. & Spach; holotype.

Hypericum sect. *Euhypericum* Godron in Gren. & Godron, Fl. France 1: 314 (1847), nom. invalid., pro parte, quoad *H. pulchrum* L., *H. hirsutum* L., *H. nummularium* L.

Hypericum sect. *Euhypericum* subsect. *Triadenioides* (Jaub. & Spach) Boiss., Fl. Orient. 1: 786 (1867) '*Triadenioidea*' pro parte, quoad *H. serpyllifolium* Lam., *H. cremulatum* Boiss., *H. fragile* Heldr. & Sart. - Nyman, Consp. Fl. Eur.: 134 (1878) '*Hypericum*' pro nom. sect., pro parte, quoad *H. fragile* Heldr. & Sart. - R. Keller in Engler & Prantl, Natürl. Pfl.Fam. 3 (6): 212 (1895); op. cit., ed. 2, 21: 178 (1925) pro parte, quoad species cit. cum *H. nummularioides* Trautv., *H. nummularium* L.

Hypericum sect. *Euhypericum* subsect. *Taeniocarpium* (Jaub. & Spach) Boiss., tom. cit.: 787 (1867) '*Taeniocarpia*' excl. parte, quoad *H. confertum* Choisy, *H. neurocalycinum* Boiss., *H. hirsutum* L., *H. repens* sensu Jaub. & Spach, *H. kotschyianum* Boiss., *H. armenum* Jaub. & Spach, *H. venustum* Fenzl. - Nyman, tom. cit.: 132 (1878) '*Hypericum*' pro nom. sect., excl. parte, quoad *H. pulchrum* L., *H. hirsutum* L., *H. repens* sensu Jaub. & Spach.

Adenosepalum Fourr. in Annl. Soc. linn. Lyon, nouv. sér. 16: 352 (1868) pro parte, quoad *A. pulchrum* (L.), Fourr., *A. nummularium* (L.) Fourr., *A. hirsutum* (L.) Fourr., non *Hypericum* sect. *Adenosepalum* Spach.

Hypericum sect. *Hypericum* subsect. *Nummularia* Nyman, tom. cit.: 134 (1878), nom. nud.

* In view of the occurrence of only $x=9$, 8 and 7 in adjacent sections, Reynaud's record of $2n=24$ for *H. scabrum* L. is unlikely to represent a diploid number based on $n=12$. Triploidy on $x=8$ is probable but further counts in Sect. *Hirtella* are necessary before tetraploidy on $x=6$ can be discounted.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 212 (1893); op. cit., ed. 2, 21 : 178 (1925) excl. parte, quoad *H. confertum* Choisy, *H. hirsutum* L., *H. pruinaum* Boiss. & Balansa, *H. kotschyannum* Boiss., *H. repens* sensu Jaub. & Spach, *H. pulchrum* L., *H. serbicum* Petrov (nomen ?), *H. armenum* Jaub. & Spach. Type : *H. repens* sensu Jaub. & Spach (= *H. linarioides* Bosse); lectotype.

Hypericum sect. *Acaulopteron* Acloque, Fl. France : 173 (1894) pro parte, quoad *H. hirsutum* L., *H. pulchrum* L., *H. nummularium* L.

Hypericum sect. *Euhypericum* subsect. *Arthrophyllum* sensu R. Keller, op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. pumilio* Bornm., non Jaub. & Spach.

Hypericum sect. *Serpyllifolium* Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 151 (1933). Type : *H. serpyllifolium* Lam. (= *H. thymifolium* Banks & Solander); holotype.

Hypericum sect. *Haplophylloides* Stef., tom. cit. : 152 (1933). Type : *H. haplophylloides* Halacsy & Baldacci; holotype.

Hypericum sect. *Nummularia* Stef., tom. cit. : 153 (1933). Type : *H. nummularium* L.; lectotype.

Hypericum sect. *Ovalifolia* Stef., tom. cit. : 153 (1933) '*Ovalifolium*'. Type : *H. ovalifolium* Stef. non Koidz. (= *H. monadenum* N. Robson); holotype.

Hypericum sect. *Fragilia* Stef., tom. cit. : 154 (1933). Type : *H. fragile* Heldr. & Sart.; lectotype.

Hypericum sect. *Pulchra* Stef., tom. cit. : 177 (1933) excl. *H. amanum* Boiss., *H. nabelekii* Stef. Type : *H. pulchrum* L.; lectotype.

Hypericum sect. *Hyssopifolia* Stef., tom. cit. : 178 (1933) pro parte, quoad *H. hirsutum* L., *H. kotschyannum* Boiss., *H. confertum* Choisy, *H. neurocalycinum* Boiss. & Heldr., *H. pruinaum* Boiss. & Balansa, *H. armenum* Jaub. & Spach, *H. theodorii* Woronow, *H. alpestre* Steven.

Hypericum sect. *Euhypericum* subsect. *Triadenioides* '*Triadenioidea*' series *Nummularioidea* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S. 15 : 221 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Hirsuta* Gorschk., tom. cit. : 227 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Perplexa* Gorschk., tom. cit. : 232 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Armena* Gorschk., tom. cit. : 235 (1949), *sine descr. lat.*

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Montana* Gorschk., tom. cit. : 245 (1949), *sine descr. lat.*, pro parte, quoad *H. venustum* Fenzl.

Hypericum sect. *Homotaenium* (R. Keller) Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 135 (1951) quoad series *Hirsuta* Y. Kimura pro parte et series *Adenosepala* Y. Kimura pro parte*.

Hypericum sect. *Homotaenium* series *Hirsuta* Y. Kimura, tom. cit. : 136 (1951) excl. parte, quoad typum. Type : *H. hirsutum* L., holotype.

Hypericum sect. *Homotaenium* series *Adenosepala* Y. Kimura, loc. cit. (1951) pro parte, excl. *H. montanum* L.

Type : *H. linarioides* Bosse.

Distribution : Europe, Mediterranean, Turkey, Caucasus, Iran, Kazakhstan (?).

22-23 species : *H. hirsutum* L., *H. confertum* Choisy, *H. pruinaum* Boiss. & Balansa, *H. kotschyannum* Boiss., *H. neurocalycinum* Boiss. & Heldr., *H. venustum* Fenzl, *H. pulchrum* L., *H. fursei* N. Robson, *H. linarioides* Bosse, *H. armenum* Jaub. & Spach, *H. theodorii* Woronow, *H. fissurale* Woronow, *H. crenulatum* Boiss., *H. nummularioides* Trautv., *H. nummularium* L., *H. monadenum* N. Robson, *H.*

* The type cited by Kimura, *H. erectum* Thunb., was not included by Keller (1893) in his *Hypericum* subsect. *Homotaenium*, but Kimura cites this as the basionym of his section.

pumilio Bornm., *H. fragile* Heldr. & Sart., *H. saxifragum* Robson & Huber-Mor., *H. taygeteum* Quezel & Contandr., *H. thymifolium* Banks & Solander, *H. haplophylloides* Halacsy & Baldacci; also *H. eleanorae* Jelenev. ?

Basic chromosome number : 9; *ploidy* 2 × .

Sect. 19. *CORIDIUM* Spach

HYPERICUM sect. CORIDIUM Spach in *Annls Sci. nat.*, sér. 2, Bot. 5 : 358 (1836).

Type : *H. coris* L. ; lectotype, see Stefanoff in *God. Agr.-les. Fak. Univ. Sofiya* II : 156 (1933).

Hypericum sect. *Perforaria* Choisy, *Prodr. Monogr. Hypér.* : 37, 44 (1821); in DC., *Prodr.* I : 546 (1824) pro parte, quoad *H. empetrifolium* Willd., *H. coris* L., *H. ericoides* L.

Hypericum A. *Hyperineae* b. *Hypericum* ε *Coridium* (Spach) Endl., *Gen. Pl.* : 1033 (1840), *status ignot.*

Hypericum sect. *Euhypericum* Godron in Gren. & Godron, *Fl. France* I : 314 (1847), *nom. invalid.*, pro parte, quoad *H. coris* L.

Hypericum sect. *Euhypericum* subsect. *Coridium* (Spach) Boiss., *Fl. Orient.* I : 786 (1867) '*Coridia*'. - Nyman, *Consp. Fl. Eur.* : 134 (1878) '*Hypericum*' pro nom. sect., excl. *H. linarifolium* Vahl, *H. lusitanicum* Poiret. - R. Keller in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 211 (1893); op. cit., ed. 2, 21 : 177 (1925).

Hypericum sect. *Acaulopteron* Acloque, *Fl. France* : 173 (1894) pro parte, quoad *H. coris* L.

Hypericum sect. *Empetrifolia* Stef., *tom. cit.* : 149 (1933). *Type* : *H. empetrifolium* Willd. ; lectotype.

Hypericum sect. *Ericoides* Stef., *tom. cit.* : 150 (1933). *Type* : *H. ericoides* L. ; lectotype.

Hypericum sect. *Galiifolia* Stef., *tom. cit.* : 156 (1933). *Type* : *H. asperuloides* Czernj. (= *H. galiifolium* Rupr.) ; holotype.

Hypericum sect. *Euhypericum* subsect. *Coridium* series *Asperuloidea* Gorsch. in Shishkin & Bobrov, *Fl. U.R.S.S.* 15 : 218 (1949), *sine descr. lat.*

Type : *H. coris* L.

Distribution : Southern Spain, N.W. Africa, Alps, Balkans and Aegean region, Caucasus.

5 species : *H. empetrifolium* Willd., *H. amblycalyx* Coust. & Gandoger, *H. coris* L., *H. asperuloides* Czernj. ex Turcz., *H. ericoides* L.

Basic chromosome number : 9; *ploidy* 2 × .

Sect. 20. *MYRIANDRA* (Spach) R. Keller

HYPERICUM sect. MYRIANDRA (Spach) R. Keller in Engler & Prantl, *Natürl. PflFam.*

3 (6) : 214 (1893); op. cit., ed. 2, 21 : 180 (1925).

Ascyrum L., *Sp. Pl.* : 787 (1753); *Gen. Pl.*, ed. 5 : 342 (1754) excl. *A. villosum* L. et *A. crux-andreae* L. pro parte, quoad syn. - Engler in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 208 (1893); op. cit., ed. 2, 21 : 174 (1925) pro parte, excl. *A. filicaule* Dyer. *Type* : *A. hypericoides* L. (= *Hypericum hypericoides* (L.) Crantz); lectotype, see Britton & Brown, *Ill. Fl. N. Un. States*, ed. 2, 2 : 528 (1913).

Hypericoides Adans., *Fam. Pl.* 2 : 443, 616 (1763). *Type* : *Ascyrum hypericoides* L. ; lectotype.

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821); in DC., Prodr. 1 : 544 (1824) pro parte, quoad *H. frondosum* Michaux, *H. amoenum* Pursh, *H. kalmianum* L.

Hypericum sect. *Perforaria* Choisy, op. cit. 37, 44 (1821); in DC., tom. cit. : 546 (1824) pro parte, quoad *H. dolabriforme* Vent., *H. cistifolium* Lam., *H. densiflorum* Pursh, *H. procumbens* Michaux, *H. rosmarinifolium* Lam., *H. prolificum* L., *H. glaucum* Michaux, *H. nudiflorum* Michaux, *H. sphaerocarpum* Michaux, *H. galioides* Lam., *H. axillare* Lam.

Hypericum sect. *Brathys* Choisy, op. cit. : 38, 58 (1821); in DC., tom. cit. : 553 (1824) pro parte, quoad *H. axillare* Lam., *H. nitidum* Lam., *H. fasciculatum* Lam., non *Brathys* Mutis ex L. f.

Myriandra Spach, Hist. Nat. Vég., Phan. 5 : 434 (1836); in Anns Sci. nat., sér. 2, Bot. 5 : 364 (1836). Type : *M. prolifica* (L.) Spach (= *Hypericum prolificum* L.); lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 23 (1951).

Brathydium Spach, Hist. Nat. Vég., Phan. 5 : 442 (1836); in Anns Sci. nat., sér. 2, Bot. 5 : 365 (1836). Type : *B. grandiflorum* Spach, nom. *superfl.* (= *Hypericum dolabriforme* Vent.); lectotype, see Y. Kimura, tom. cit. : 24 (1951) (as *B. dolabriforme* (Vent.) Y. Kimura).

Isophyllum Spach, Hist. Nat. Vég., Phan. 5 : 432 (1836); in Anns Sci. nat., sér. 2, Bot. 5 : 367 (1836), non *Isophyllum* Hoffmann (1814). Type : *I. drummondii* Spach (= *Hypericum microsepalum* (Torrey & Gray) A. Gray ex S. Watson); holotype.

Streptalon Raf., Fl. Tellur. 3 : 80 (1837). Type : *S. dolabriforme* (Vent.) Raf. (= *Hypericum dolabriforme* Vent.); holotype.

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

Hypericum C. *Brathydineae* l. *Myriandra* (Spach) Endl., tom. cit. : 1033 (1840), status *ignot.*

Hypericum C. *Brathydineae* m. *Brathydium* (Spach) Endl., tom. cit. : 1033 (1840), status *ignot.*

Hypericum subgen. *Myriandra* (Spach) C. Koch, Dendrologie, 1 : 499 (1869) ? excl. parte.

Hypericum sect. *Myriandra* subsect. *Centrosperma* R. Keller, op. cit. 3 (6) : 214 (1893); op. cit., ed. 2, 21 : 180 (1925). Type : *H. prolificum* L.; lectotype, see P. Adams in Contr. Gray Herb. Harv. 189 : 12 (1962).

Hypericum sect. *Myriandra* subsect. *Suturosperma* R. Keller, op. cit. 3 (6) : 214 (1893); op. cit., ed. 2, 21 : 180 (1925). Type : *H. nudiflorum* Michaux, lectotype.

Hypericum sect. *Brathydium* (Spach) R. Keller, op. cit. 3 (6) : 214 (1893); op. cit., ed. 2, 21 : 181 (1925).

Hypericum sect. *Brathydium* subsect. *Eubrathydium* R. Keller, op. cit. 3 (6) : 214 (1893), nom. *invalid.*; op. cit., ed. 2, 21 : 181 (1925). Type : *H. dolabriforme* Vent.; lectotype.

Hypericum sect. *Brathydium* subsect. *Pseudobrathydium* R. Keller, op. cit. 3 (6) : 214 (1893); op. cit., ed. 2, 21 : 181 (1925). — P. Adams, tom. cit. : 35 (1962) sub sect. *Myriandra*. Type : *H. buckleyi* M. A. Curtis; holotype.

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

Hypericum sect. *Brathys* subsect. *Eubrathys* R. Keller, op. cit., ed. 2, 21 : 181 (1925), nom. *invalid.*, pro parte, quoad *H. nitidum* Lam.

Hypericum sect. *Brathys* subsect. *Spachium* R. Keller, op. cit., ed. 2, 21 : 181 (1925) pro parte, quoad *H. adpressum* W. Barton ('Bast.').

Hypericum sect. *Myriandra* subsect. *Brathydium* (Spach) P. Adams, tom. cit. : 36 (1962), nom. *synon.*

Hypericum sect. *Isophyllum* (Spach) P. Adams, tom. cit. : 36 (1962), nom. *synon.*

Type : *H. prolificum* L.

Distribution : Eastern and central N. America, Central America south to Honduras Republic, Bermuda, Bahamas, Greater Antilles.

30 species : *H. kalmianum* L., *H. lobocarpum* Gattinger, *H. densiflorum* Pursh, *H. prolificum* L., *H. frondosum* Michaux, *H. galioides* Lam., *H. lissophloeus* P.

Adams, *H. chapmanii* P. Adams, *H. fasciculatum* Lam., *H. nitidum* Lam., *H. brachyphyllum* (Spach) Steudel, *H. reductum* P. Adams, *H. lloydii* (Svenson) P. Adams, *H. exile* P. Adams, *H. myrtifolium* Lam., *H. nudiflorum* Michaux, *H. apocynifolium* Small, *H. buckleyi* M. A. Curtis, *H. cistifolium* Lam., *H. sphaerocarpum* Michaux, *H. dolabrifforme* Vent., *H. adpressum* W. Barton, *H. ellipticum* Hook., *H. microsepalum* (Torrey & Gray) A. Gray ex S. Watson, *H. crux-andreae* (L.) Crantz *H. edisonianum* (Small) Adams & Robson, *H. tetrapetalum* Lam., *H. hypericoides* (L.) Crantz, *H. stragulum* Adams & Robson, *H. suffruticosum* Adams & Robson.

Basic chromosome number : 9 ; ploidy $2 \times$.

Sect. 21. **WEBBIA** (Spach) R. Keller

HYPERICUM sect. WEBBIA (Spach) R. Keller in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 211 (1893) ; op. cit., ed. 2, 21 : 177 (1925) excl. *H. cambessedesii* Cosson ex Marès & Vigineix.

Hypericum sect. *Ascyreia* Choisy, *Prodr. Monogr. Hypér.* : 37, 38 (1821) ; in DC., *Prodr.* 1 : 544 (1824) pro parte, quoad *H. canariense* L., *H. floribundum* Aiton.

Webbia Spach, *Hist. Nat. Vég., Phan.* 5 : 408 (1836) ; in *Annls Sci. nat., sér. 2, Bot.* 5 : 356 (1836). Type : *W. platypetala* Spach (\equiv *Hypericum canariense* L.) ; lectotype.*

Hypericum A. *Hyperineae* a. *Webbia* (Spach) Endl., *Gen. Pl.* : (1) 32 (1840), *status ignot.*

Type : *H. canariense* L.

Distribution : Canary Is., Madeira.

1 *species* : *H. canariense* L.

Basic chromosome number : 10, ploidy $4 \times$.

Sect. 22. **ARTHROPHYLLUM** Jaub. & Spach

HYPERICUM sect. ARTHROPHYLLUM Jaub. & Spach, *Ill. Pl. Orient.* 1 : 44 (1842).

Type : *H. rupestre* Jaub. & Spach ; lectotype, see Y. Kimura in Nakai & Honda, *Nova Fl. Jap.* 10 : 113 (1951).

Hypericum sect. *Perforaria* Choisy, *Prodr. Monogr. Hypér.* : 37, 44 (1821) ; in DC., *Prodr.* 1 : 546 (1824) pro parte, quoad *H. nanum* Poiret.

Hypericum sect. *Holosepalum* Spach in *Annls Sci. nat., sér. 2, Bot.* 5 : 357 (1836) pro parte, quoad *H. nanum* Poiret.

Hypericum A. *Hyperineae* b. *Hypericum* α *Holosepalum* (Spach) Endl., *Gen. Pl.* : 1032 (1840), *status ignot.* pro parte, quoad *H. nanum* Poiret.

Hypericum sect. *Euhypericum* subsect. *Arthropphyllum* (Jaub. & Spach) Boiss., *Fl. Orient.* 1 : 786 (1867) '*Arthropphylla*' – R. Keller in Engler & Prantl, *Natürl. PflFam.*, ed. 2, 21 : 178 (1925) excl. *H. pumilio* Bornm.

Type : *H. rupestre* Jaub. & Spach.

Distribution : Levant, southern Turkey.

* Spach (at first) did not include the Linnaean species in his new genus: he merely suggested that *W. heterophylla* or *W. platypetala* might be synonymous with *Hypericum canariense* L.

4 species : *H. cardiophyllum* Boiss., *H. rupestre* Jaub. & Spach, *H. nanum* Poiret, *H. vacciniifolium* Hayek & Siehe.

Basic chromosome number : unknown.

Sect. 23. **TRIADENIOIDES** Jaub. & Spach

HYPERICUM sect. TRIADENIOIDES Jaub. & Spach, Ill. Pl. Orient. 1 : 49 (1842). – Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 145 (1933) '*Triadenioidea*' pro parte, quoad *H. scopulorum* Balf. f. '*scopulosum*'. Type : *H. cuneatum* Poiret (= *H. pallens* Banks & Solander); holotype.

Hypericum sect. *Holosepalum* Spach in Anns Sci. nat., sér. 2, Bot. 5 : 357 (1836) pro parte, quoad *H. cuneatum* Poiret.

Hypericum A. *Hyperineae* b. *Hypericum* α *Holosepalum* (Spach) Endl., Gen. Pl. : 1032 (1840), status ignot., pro parte, quoad *H. cuneatum* Poiret.

Hypericum sect. *Euhypericum* subsect. *Triadenioides* (Jaub. & Spach) Boiss., Fl. Orient. 1 : 786 (1867) '*Triadenioidea*' – R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 212 (1893) excl. parte, quoad typum; op. cit., ed. 2, 21 : 178 (1925) excl. parte, quoad *H. scopulorum* Balf. f. '*scopulosum*', *H. cuneatum* Poiret.

Hypericum sect. *Cuneata* Stef., op. cit. : 151 (1933) '*Cuneatum*' nom. *superfl.* Type : *H. cuneatum* Poiret (= *H. pallens* Banks & Solander); holotype.

Type : *H. pallens* Banks & Solander.

Distribution : Socotra, Levant, southern Turkey,

5 species : including *H. scopulorum* Balf. f., *H. tortuosum* Balf. f., *H. ternatum* Poulter, *H. pallens* Banks & Solander.

Basic chromosome number : 8 (Reynaud, 1973); ploidy $2 \times$.

Sect. 24. **HETEROPHYLLA** N. Robson

HYPERICUM sect. HETEROPHYLLA N. Robson in Notes R. Bot. Gdn, Edinb. 27 : 185 (1967) '*Heterophyllum*'. Type : *H. heterophyllum* Vent.; holotype.

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821); in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. heterophyllum* Vent.

Hypericum sect. *Holosepalum* Spach in Anns Sci. nat., sér. 2, Bot. 5 : 357 (1836) pro parte, quoad *H. heterophyllum* Vent.

Hypericum A. *Hyperineae* b. *Hypericum* α *Holosepalum* (Spach) Endl., Gen. Pl. : 1032 (1840), status ignot., pro parte, quoad *H. heterophyllum* Vent.

Hypericum sect. *Euhypericum* subsect. *Triadenioides* (Jaub. & Spach) Boiss., Fl. Orient. 1 : 786 (1867) '*Triadenioides*', pro parte, quoad *H. heterophyllum* Vent. – R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 212 (1803); op. cit., ed. 2, 21 : 178 (1925).

Hypericum sect. *Triadenioides* sensu Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 145 (1933) '*Triadenioidea*', pro parte, quoad *H. heterophyllum* Vent., non Jaub. & Spach.

Type : *H. heterophyllum* Vent.

Distribution : North-western Turkey.

1 species : *H. heterophyllum* Vent.

Basic chromosome number : 9 (Reynaud, 1973); ploidy $2 \times$.

Sect. 25. **ADENOTRIAS** (Jaub. & Spach) R. Keller

HYPERICUM sect. ADENOTRIAS (Jaub. & Spach) R. Keller in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 209 (1893); op. cit., ed. 2, 21 : 175 (1925).

Elodes Adans., *Fam. Pl.* 2 : 444, 553 (1763) pro parte, quoad '*Hypericum* 9 Lin. Sp. 784'.

Martia Sprengel, *Anl. Kennt. Gewächse*, ed. 2, 2 : 788 (1818), nom illegit. pro parte, quoad '*Elodea* Adans.' pro parte; in L., *Syst. Veg.*, ed. 16, 3 : 333 (1826) pro parte, quoad *M. polyandra* Sprengel (\equiv *Hypericum aegypticum* L.).

Hypericum sect. *Perforaria* Choisy, *Prodr. Monogr. Hypér.* : 37, 44 (1821) : in DC., *Prodr.* 1 : 546 (1824) pro parte, quoad *H. aegypticum* L. '*aegyptiacum*'.

Elodea sensu Jack, *Malayan Misc.* 2 (7) : 25 (1822); in Hooker's *J. Bot.* 1 : 371 (1834) pro parte, quoad *E. aegyptica* (L.) Jack '*Egyptiaca*'.

Triadenia Spach in *Annl. Sci. nat.*, sér. 2, Bot. 5 : 172, 354 (1836); *Hist. Nat. Vég.*, Phan. 5 : 370 (1836). Type : *T. microphylla* Spach, *nom. superfl.* (\equiv *Hypericum aegypticum* L.); lectotype.

Episiphis Ref., *Fl. Tellur.* 3 : 78 (1837). Type : *E. parvifolia* Ref., *nom. superfl.* (\equiv *Hypericum aegypticum* L.); holotype.

Elodes c. *Triadenia* (Spach) Endl., *Gen. Pl.* : 1034 (1840) '*Elodea*', *status ignot.*

Adenotrias Jaub. & Spach, *Ill. Pl. Orient.* 1 : 76 (1842). Type : *A. phrygia* Jaub. & Spach (\equiv *Hypericum russegeri* (Fenzl) R. Keller); lectotype.

Elodes d. *Adenotrias* (Jaub. & Spach) Endl., *Gen. Pl.*, *Suppl.* 5 : 70 (1850) '*Elodea*', *status ignot.*

Triadenia sect. *Eutriadenia* Boiss., *Fl. Orient.* 1 : 783 (1867) *nom. invalid.* Type : *T. aegyptica* (L.) Boiss. '*aegyptiaca*' (\equiv *Hypericum aegypticum* L.); lectotype.

Triadenia sect. *Adenotrias* (Jaub. & Spach) Boiss., *tom. cit.* : 784 (1867).

Hypericum sect. *Triadenia* (Spach) R. Keller in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 208 (1893); op. cit., ed. 2, 21 : 175 (1925).

Elodes sect. *Adenotrias* (Jaub. & Spach) Y. Kimura in Nakai & Honda, *Nova Fl. Jap.* 10 : 18 (1951). – Greuter in *Candollea* 20 : 216 (1965).

Type : *Hypericum russegeri* Fenzl.

Distribution : Morocco to the Levant.

3 species : *H. russegeri* Fenzl, *H. aciferum* (Greuter) N. Robson, *H. aegypticum* L.

Basic chromosome number : 10 (Ornduff, pers. comm.).

Sect. 26. **HUMIFUSOIDEUM** R. Keller

HYPERICUM sect. HUMIFUSOIDEUM R. Keller in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 211 (1893); op. cit., ed. 2, 21 : 177 (1925). – N. Robson in *Kew Bull.* 12 : 436 (1958), excl. *H. kiboense* Oliv., *H. conjunctum* N. Robson non *H. conjunctum* Y. Kimura, *H. aethiopicum* Thunb.; in *Blumea* 20 : 257 (1973). Type : *H. peplidifolium* A. Rich.; holotype.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* sensu R. Keller in Engler & Prantl, *Natürl. PflFam.*, ed. 2, 21 : 178 (1925) pro parte, quoad *H. hellwigii* Lauterb., *H. wilmsii* R. Keller, non R. Keller (1893).

Hypericum sect. *Brathys* subsect. *Spachium* sensu R. Keller, op. cit., ed. 2, 21 : 181 (1925) pro parte, quoad *H. woodii* R. Keller, non R. Keller (1893).

Hypericum sect. *Pulogensia* N. Robson in *Blumea* 20 : 259 (1973) excl. spp. *Taiwanianae*. Type : *H. pulogensis* Merr.; holotype.

Type : *H. peplidifolium* A. Rich.

Distribution : Tropical and South Africa, Madagascar, New Guinea, Philippines, Java, Sumatra.

10 species : *H. sewense* N. Robson, *H. macgregorii* F. v. Muell., *H. saruwagedicum* Diels, *H. bifurcatum* N. Robson, *H. papuanum* Ridley, *H. natalense* J. M. Wood & Evans, *H. wilmsii* R. Keller, *H. peplidifolium* A. Rich., *H. pulogense* Merr., *H. beccarii* N. Robson.

Basic chromosome number : 12 ; *ploidy* 2x.

Sect. 27. **ADENOSEPALUM** Spach

HYPERICUM sect. ADENOSEPALUM Spach in *Annls Sci. nat.*, sér. 2, Bot. 5 : 357 (1836) excl. *H. elegans* Stephan ex Willd., *H. linearifolium* Vahl '*linearifolium*', *H. hyssopifolium* Vill., *H. serpyllifolium* Lam., *H. pulchrum* L., *H. nummularium* L., *H. formosum* Kunth, *H. triplinerve* Vent. Type : *H. montanum* L. ; lectotype, see N. Robson in *Notes R. Bot. Gdn, Edinb.* 27 : 195 (1967).

Hypericum sect. *Perforaria* Choisy, *Prodr. Monogr. Hypér.* : 37, 44 (1821) ; in DC., *Prodr.* 1 : 546 (1824) pro parte, quoad *H. tomentosum* L., *H. lanuginosum* Lam., *H. glandulosum* Aiton, *H. reflexum* L.f., *H. montanum* L., *H. lusitanicum* Poirét, *H. elodeoides* Choisy, *H. aethiopicum* Thunb., *H. napaulense* Choisy.

Hypericum A. *Hyperineae* b. *Hypericum* γ *Adenosepalum* (Spach) Endl., *Gen. Pl.* : 1032 (1840), *status ignot.*, excl. spec. supra cit. sub *Hypericum* sect. *Adenosepalum* Spach.

Hypericum sect. *Euhypericum* Godron in Gren. & Godron, *Fl. France* 1 : 314 (1847), *nom. invalid.*, pro parte, quoad *H. tomentosum* L., *H. montanum* L.

Hypericum sect. *Euhypericum* subsect. *Triadenioidea* (Jaub. & Spach) Boiss., *Fl. Orient.* 1 : 786 (1867) '*Triadenioidea*', pro parte, quoad *H. athoum* Boiss. & Orph. – Nyman, *Consp. Fl. Eur.* : 134 (1878) '*Hypericum*' pro nom. sect., pro parte. – R. Keller in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 212 (1893) ; op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. cuisinii* Barbey, *H. sanctum* Degen.

Hypericum sect. *Euhypericum* subsect. *Taeniocarpium* (Jaub. & Spach) Boiss., *tom. cit.* : 787 (1867) '*Taeniocarpia*' pro parte, quoad *H. montanum* L., *H. delphicum* Boiss. & Heldr., *H. lanuginosum* Lam., *H. atomarium* Boiss., *H. scabrellum* Boiss., *H. pestalozzae* Boiss., *H. sinaicum* Steudel & Hochst. ex Boiss. – Nyman, *tom. cit.* : 132 (1878), '*Hypericum*' pro nom. sect., pro parte, quoad *H. montanum* L., *H. delphicum* Boiss. & Heldr. *H. atomarium* Boiss., *H. tomentosum* L., *H. caprifolium* Boiss.

Adenosepalum (Spach) Fourr. in *Annls Soc. linn. Lyon, nouv. sér.* 16 : 352 (1868), excl. *A. pulchrum* (L.) Fourr., *A. nummularium* (L.) Fourr., *A. hirsutum* (L.) Fourr.

Hypericum sect. *Hypericum* subsect. *Coridium* sensu Nyman, *tom. cit.* : 134 (1878) '*Coridia*' pro parte, quoad *H. lusitanicum* Poirét, non Boiss.

Ascyrum sensu Engler in Engler & Prantl, *Natürl. PflFam.* 3 (6) : 208 (1893) ; op. cit., ed. 2, 21 : 174 (1925) pro parte, quoad *A. fliccaule* Dyer.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* R. Keller in Engler & Prantl, *op. cit.* 3 (6) : 212 (1893) ; op. cit., ed. 2, 21 : 178 (1925) pro parte, quoad *H. pestalozzae* Boiss., *H. montanum* L., *H. aethiopicum* Thunb., *H. elodeoides* Choisy, *H. intermedium* Steudel, *H. delphicum* Boiss. & Heldr., *H. lanuginosum* Lam., *H. atomarium* Boiss., *H. scabrellum* Boiss., *H. sinaicum* Steudel & Hochst. ex Boiss., *H. tomentosum* L., *H. pubescens* Boiss., *H. caprifolium* Boiss., *H. naudinianum* Coss., *H. coadunatum* C. Smith ex Link, *H. monanthemum* Hook. f. & Thomson ex Dyer, *H. reflexum* L. f., *H. taubertii* Barbey, *H. lusitanicum* Poirét, *H. atlanticum* Coss.

Hypericum sect. *Acaulopteron* Aclouque, *Fl. France* : 173 (1894) excl. parte, quoad *H. tomentosum* L., *H. montanum* L. Type : *H. montanum* L. ; lectotype.

Hypericum sect. *Reflexa* Stef. in God. Agr.-les. Fak. Univ. Sofiya 11 : 148 (1933). Type : *H. reflexum* L. f. ; lectotype.

Hypericum sect. *Montana* Stef., tom. cit. : 162 (1933) excl. parte (d). Type : *H. montanum* L. ; lectotype.

Hypericum sect. *Perforata* Stef., tom. cit. : 174 (1933) pro parte, quoad *H. tomentosum* L., *H. lusitanicum* Poirlet, *H. pubescens* Boiss.

Hypericum sect. *Euhypericum* subsect. *Oligostema* series *Humifusa* Gorschk. in Shishkin & Bobrov, Fl. U.R.S.S., 15 : 219 (1949), *sine descr. lat.*, pro parte, quoad *H. formosissimum* Takht.

Hypericum sect. *Euhypericum* subsect. *Homotaenium* series *Montana* Gorschk., tom. cit. : 245 (1949), *sine descr. lat.*, excl. *H. venustum* Fenzl.

Hypericum sect. *Homotaenium* series *Adenosepala* Y. Kimura in Nakai & Honda, Nova, Fl. Jap. 10 : 136 (1951) excl. parte, quoad typum. Type : *H. montanum* L. ; holotype.

Hypericum sect. *Humifusoideum* sensu N. Robson in Kew Bull. 12 : 436 (1958) pro parte, quoad *H. kiboense* Oliv., *H. conjunctum* N. Robson non *H. conjunctum* Y. Kimura, *H. aethiopicum* Thunb., non R. Keller.

Type : *H. montanum* L.

Distribution : Canary Is., Madeira, Africa, Europe, S.W. Asia, India to China and Thailand.

About 33 species : including *H. glandulosum* Aiton, *H. reflexum* L. f., *H. kiboense* Oliver, *H. conjungens* N. Robson, *H. aethiopicum* Thunb., *H. annulatum* Moris, *H. montanum* L., *H. decaisneanum* Coss. & Daveau, *H. delphicum* Boiss. & Heldr., *H. athoum* Boiss. & Orph., *H. atomarium* Boiss., *H. cuisinii* Barbey, *H. lanuginosum* Lam., *H. huber-morathii* N. Robson, *H. minutum* P. H. Davis & Poulter, *H. formosissimum* Takht., *H. somaliense* N. Robson, *H. tomentosum* L., *H. pubescens* Boiss., *H. sinaicum* Steudel & Hochst. ex Boiss., *H. coadunatum* C. Smith ex Link, *H. caprifolium* Boiss., *H. elodeoides* Choisy, *H. wightianum* Wall. ex Wight & Arn., *H. napaulense* Choisy, *H. filicaule* (Dyer) N. Robson ; also *H. psilophytum* (Diels) Maire ?

Basic chromosome numbers : 9, 8 ; ploidy $2 \times$.

Sect. 28. **ELODES** (Adans.) W. Koch

HYPERICUM sect. ELODES (Adans.) W. Koch, Syn. Fl. Germ. Helv., ed. 2, 1 : 148 (1843).

Elodes Adans., Fam. Pl. 2 : 444, 553 (1763), excl. '*Hypericum* 9. Lin. Sp. 784'. – Juss., Gen. Pl. : 255 (1789) '*Elodea*'. – Spach in Annl. Sci. nat., sér. 2, Bot. 5 : 171, 353 (1836) ; Hist. Nat. Vég., Phan. 5 : 369 (1836). – Reichenb., Deutsche Botaniker 1 : 211 (1841) '*Helodea*'. Type : *E. palustris* Spach (\equiv *Hypericum elodes* L.) ; lectotype, see Spach in Annl. Sci. nat., sér. 2, Bot. 5 : 172 (1836).

Martia Sprengel, Anl. Kennt. Gewächse, ed. 2, 2 : 788 (1818), *nom. superfl.*, quoad '*Elodea* Adans.' pro parte. Type : *Hypericum elodes* L. ; lectotype.

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821) ; in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. elodes* L.

Elodes b. *Elodes* (Adans.) Endl., Gen. Pl. : 1034 (1840), *stat. ignot.*, '*Elodea*' pro nom. gen.

Tripentas Casp. in Mber. K. preuss. Akad. Wiss. 1857 : 43 (1857) ; in Jb. wiss. Bot. 1 : 497 (1858), *nom. superfl.* Type : *Elodes palustris* Spach (\equiv *Hypericum elodes* L.) ; holotype.

Spachelodes Y. Kimura in J. Jap. Bot. 11 : 832 (1935) *nom. superfl.* Type : *S. elodes* (L.) Y. Kimura (\equiv *Hypericum elodes* L.) ; holotype.

Type: *H. elodes* L.

Distribution: Azores, W. Europe.

1 species: *H. elodes* L.

Basic chromosome number: 8; ploidy $4 \times$.

Sect. 29. **BRATHYS** (Mutis ex L. f.) Choisy

HYPERICUM sect. BRATHYS (Mutis ex L. f.) Choisy, Prodr. Monogr. Hypér.: 38, 58 (1821); in DC., Prodr. 1: 553 (1824) excl. *H. revolutum* Vahl, *H. axillare* Lam., *H. nitidum* Lam., *H. fasciculatum* Lam.

Brathys Mutis ex. L. f., Suppl.: 43, 268 (1781). Type: *B. juniperina* L. f. (\equiv *Hypericum brathys* Smith, nom. superfl.); holotype.

Hypericum sect. *Perforaria* Choisy, op. cit.: 37, 44 (1821); in DC., tom. cit.: 546 (1824) pro parte, quoad *H. thymifolium* Kunth, non *H. thymifolium* Banks & Solander, (\equiv *H. humboldtianum* Steudel).

Hypericum C. *Brathydineae* n. *Brathys* (Mutis ex L. f.) Endl., Gen. Pl.: 1033 (1840), status ignot., pro parte, quoad typum et spec. Jussiaei.

Hypericum sect. *Brathys* subsect. *Eubrathys* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6): 214 (1893); op. cit., ed. 2, 21: 181 (1925), nom. invalid., excl. *H. nitidum* Lam., *H. gnidioides* Seeman, *H. silenoides* Juss. non sensu R. Keller, *H. epigeium* R. Keller, *H. rigidum* St.-Hil., *H. chamaemyrtos* Triana & Planchon 'chamaemyrtos Triana', *H. rufescens* Klotzsch, *H. pelleterianum* St.-Hil., *H. myrianthum* Cham. & Schlecht. Type: *H. brathys* Smith, nom. superfl.; lectotype.

Savothra sect. *Brathys* (Mutis ex L. f.) Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10: 232 (1951).

Type: *H. brathys* Smith, nom. superfl.* (\equiv *H. juniperinum* Kunth?).

Distribution: Central and South America (northern Andes, Roraima), Cuba, Hispaniola.

About 48 species: including *H. styphelioides* A. Rich., *H. jahnii* R. Keller, *H. lancifolium* Gleason, *H. roraimense* Gleason, *H. magniflorum* Cuatrec., *H. stenocladus* Cuatrec., *H. carinosum* R. Keller, *H. phellos* Gleason, *H. stenopetalum* Turczj., *H. platyphyllum* Gleason, *H. mexicanum* L. f., *H. pimelioides* Planchon & Linden ex Triana & Planchon, *H. juniperinum* Kunth, *H. strictum* Kunth, *H. struthioli-folium* Juss., *H. weberbaueri* R. Keller, *H. thuyoides* Kunth, *H. hartwegii* Benth., *H. myricariifolium* Hieron., *H. laricifolium* Juss., *H. bryoides* Gleason, *H. andinum* Gleason, *H. quitense* R. Keller, *H. loxense* Benth., *H. lycopodioides* Triana & Planchon, *H. sabiniforme* Trev., *H. goyanesii* Cuatrec., *H. tamanum* Cuatrec., *H. baccharoides* Cuatrec., *H. cuatrecasii* Gleason, *H. ericifolium* Steyerm., *H. garciae* Pierce, *H. lancioides* Cuatrec., *H. meridense* Steyerm., *H. millefolium* Urban & Ekman, *H. prostratum* Cuatrec., *H. pseudocaracasatum* Steyerm., *H. pycnophyllum* Urban, *H. stuebelii* Hieron., *H. tetrastichum* Cuatrec., *H. humboldtianum* Steudel, *H. aciculare* Kunth, *H. caracasatum* Willd.

Basic chromosome number: 12; ploidy $2 \times$, $3 \times$?

* *H. juniperinum* Kunth has a different type from *Brathys juniperina* L. f. (\equiv *H. brathys* Smith) but may be a taxonomic synonym of it.

Sect. 30. **SPACHIUM** (R. Keller) N. RobsonHYPERICUM sect. SPACHIUM (R. Keller) N. Robson, *stat. nov.*

Sarothra L., Spl. Pl. : 272 (1753) ; Gen. Pl., ed. 5 : 133 (1754). Type : *S. gentianoides* L. (= *Hypericum gentianoides* (L.) Britton, Sterns & Poggenb.) ; holotype.

Ascyrum L., op. cit. : 787 (1753) ; op. cit. : 342 (1754) pro parte, quoad *A. villosum* L. et *A. crux-andreae* L. pro parte, quoad syn.

Knifa Adans., Fam. Pl. 2 : 444, 541 (1763). – Vent., Tabl. Regne Vég. 3 : 144 (1799) 'Kniffa'. Type : *Hypericum mutilum* L. ; lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 233 (1951) (as *Sarothra mutila* (L.) Y. Kimura).

Hypericum sect. *Perforaria* Choisy, Prodr. Monogr. Hypér. : 37, 44 (1821) ; in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. angulosum* Michaux, *H. virgatum* Lam., *H. gramineum* Forster f., *H. connatum* Lam., *H. japonicum* Thunb. ex Murray, *H. dichotomum* Lam., *H. pilosum* Walter, *H. simplex* Michaux, *H. pusillum* Choisy, *H. involutum* (Labill.) Choisy, *H. silenoides* Juss., *H. quinquenervium* Walter, *H. brevistylum* Choisy, *H. canadense* L., *H. brasiliense* Choisy, *H. fastigiatum* Kunth, *H. indecorum* Kunth, *H. tarquense* Kunth.

Martia sensu Sprengel in L., Syst. Veg., ed. 16, 3 : 333 (1826) pro parte, quoad *M. dichotoma* (Lam.) Sprengel, non Sprengel (1818).

Receveura Vellozo, Fl. Flum. : 237 (1829) ; op. cit., Atlas, 5 : t. 119, 120 (1831). Type : *R. cordata* Vellozo (= *Hypericum connatum* Lam.) ; lectotype.

Tridia Korth. in Tijdschr. Natürl. Gesch. Physiol. 3 : 17 (1836). Type : *T. frankenioides* Korthals (= *Hypericum japonicum* Thunb. ex Murray) ; holotype.

Hypericum C. *Brathydineae* n. *Brathys* (Mutis ex L. f.) Endl., Gen. Pl. : 1033 (1840), *status ignot.*, pro parte, excl. typum et spec. Jussiaei.

Hypericum sect. *Brathys* subsect. *Connatum* R. Keller in Engler & Prantl, Natürl. PflFam. 3 (6) : 214 (1893). Type : *H. connatum* Lam. ; holotype.

Hypericum sect. *Brathys* subsect. *Multistamineum* R. Keller, op. cit. 3 (6) : 214 (1893). Type : *H. pilosum* Walter 'pilosum Michx.' (= *H. setosum* L.) ; lectotype.

Hypericum sect. *Brathys* subsect. *Spachium* R. Keller, op. cit. 3 (6) : 214 (1893) ; op. cit., ed. 2, 21 : 181 (1925) excl. *H. hellwigii* Lauterb., *H. wilmsii* R. Keller, *H. collinum* Schlecht. & Cham., *H. adpressum* W. Barton ('Bast.') – Rodríguez-Jiménez in Mems Soc. Cienc. nat. La Salle, 33 (94–95) : 47 (1973). Type : *H. sarothra* Michaux (= *H. gentianoides* (L.) Britton, Sterns & Poggenb.) ; lectotype, see Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 233 (1951).

Sanidophyllum Small in Bull. Torrey Bot. Cl. 51 : 391 (1924) – P. Adams in Rhodora 64 : 232 (1962). Type : *S. cumulicola* Small (= *Hypericum cumulicola* (Small) P. Adams) ; holotype.

Sarothra sect. *Trigynobrathys* Y. Kimura, tom. cit. : 233 (1951). Type : *S. myriantha* (Cham. & Schlecht.) Y. Kimura (= *Hypericum myrianthum* Cham. & Schlecht.) ; holotype.

Sarothra sect. *Spachium* (R. Keller) Y. Kimura, tom. cit. : 233 (1951).

Sarothra sect. *Spachium* series *Eusarothra* Y. Kimura, tom. cit. : 233 (1951) *nom. invalid.* Type : *S. gentianoides* L. (= *Hypericum gentianoides* (L.) Britton, Sterns & Poggenb.) ; holotype.

Sarothra sect. *Spachium* series *Knifa* (Adans.) Y. Kimura, tom. cit. : 233 (1951) 'Kniffa'.

Sarothra sect. *Spachium* series *Japonica* Y. Kimura, tom. cit. : 233 (1951). Type : *S. japonica* (Thunb. ex Murray) Y. Kimura (= *Hypericum japonicum* Thunb. ex Murray) ; holotype.

Type : *H. gentianoides* (L.) Britton, Sterns & Poggenb.

Distribution : America, tropical and south Africa, Madagascar, tropical and east Asia, Australia, New Zealand, New Caledonia, Hawaii ; west and central Europe (adventive ?).

About 54 species: including *H. meridionale* L. B. Smith, *H. teretiusculum* St.-Hil., *H. gymnanthum* Engelm. & Gray, *H. mutilum* L., *H. boreale* (Britton) E. P. Bicknell, *H. japonicum* Thunb. ex Murray, *H. connatum* Lam., *H. caprifoliatum* Cham. & Schlecht., *H. cordiforme* St.-Hil., *H. ternum* St.-Hil., *H. rigidum* St.-Hil., *H. denudatum* St.-Hil., *H. cavernicola* L. B. Smith, *H. gnidioides* Seeman, *H. pine-torum* Standley, *H. galinum* Blake, *H. drummondii* (Grev. & Hook.) Torrey & Gray, *H. gentianoides* (L.) Britton, Sterns & Poggenb., *H. pauciflorum* Kunth, *H. diffusum* Rose, *H. lalandii* Choisy, *H. sellowianum* R. Keller, *H. microlicioides* L. B. Smith, *H. legrandii* Arechav., *H. chamaemyrtus* Triana & Planchon, *H. denticulatum* Walter, *H. setosum* L., *H. cumulicola* (Small) P. Adams, *H. rivulare* Arechav., *H. globuliferum* R. Keller, *H. humbertii* Staner, *H. scioanum* Chiov., *H. oligandrum* Milne-Redh., *H. perrieri* N. Robson, *H. fuertesii* Urban, *H. diosmoides* Griseb., *H. dichotomum* Lam., *H. arenarioides* A. Rich., *H. brasiliense* Choisy, *H. pleiostylum* Rodr.-Jim., *H. hilaireanum* L. B. Smith, *H. piriai* Arechav., *H. myrianthum* Cham. & Schlecht., *H. notiale* L. B. Smith, *H. pelleterianum* St.-Hil., *H. brevistylum* Choisy, *H. majus* (A. Gray) Britton, *H. canadense* L., *H. anagalloides* Cham. & Schlecht., *H. polyanthemum* Klotzsch ex Reichardt, *H. silenoides* Juss., *H. philonotis* Cham. & Schlecht., *H. gramineum* Forster f.

Basic chromosome numbers: 12, 9, 8, 7; ploidy $2\times$, $3\times$?

OTHER NAMES FOR INFRAGENERIC TAXA IN *HYPERICUM*

The following names applying to infrageneric taxa in *Hypericum*, as herein understood, have also been published. Either they include more than one of the sections listed above or their type is uncertain.

1. *Hypericaceae* trib. *Desmostemoneae* 'sect'. *Elodeineae* Spach in *Annls Sci. nat.*, sér. 2, Bot. 5: 353 (1836) *nom. invalid.* pro parte, excl. '*Elodea* Spach'.
Hypericineae (2) *Hypericeae* (c) *Vismieae* (α) *Elodeinae* Reichenb., *Handbuch. Nat. Pflanzensyst.*: 308 (1837) pro parte, excl. '*Elodea* Adans.'
Elodes sensu Endl., *Gen. Pl.*: 1033 (1840) pro parte, excl. 'a. *Elodea* Spach', '*Elodea*'.
Hypericaceae subfam. *Vismioideae* trib. *Elodeae* Y. Kimura in Nakai & Honda, *Nova Fl. Jap.* 10: 18 (1951) pro parte, excl. *Triadenum* Raf.
 (All include *Elodes* Adans., *Triadenia* Spach.)
2. *Hypericaceae* trib. *Hypericeae* 'sect.' *Drosanthineae* Spach, *tom. cit.*: 354 (1836), *nom. invalid.*
Hypericineae (2) *Hypericeae* (b) *Hypericeae genuinae* (α) *Drosantheae* Reichenb., *tom. cit.*: 307 (1837).
Hypericum a. *Drosanthinae* (Spach) Endl., *tom. cit.*: 1032 (1840), *status ignot.*
 (Comprises *Eremosporus* Spach ('*Eremocarpus*' Reichenb., sphalm.), *Drosanthe* Spach.)

3. *Hypericaceae* trib. *Hypericeae* 'sect'. *Hypericineae* Spach, tom. cit. : 355 (1836), *nom. invalid.*
Hypericineae (2) *Hypericeae* (b) *Hypericeae genuinae* (β) *Androsaemeae* Reichenb., tom. cit. : 307 (1837) pro parte.
Hypericum A. *Hyperineae* (Spach) Endl., tom. cit. : 1032 (1840), *status ignot.*
Hypericaceae subfam. *Hypericoideae* trib. *Hypericeae* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 21 (1951) excl. parte.
 (Comprises *Webbia* Spach, *Hypericum* sensu Spach and Y. Kimura, *Olympia* Spach.)
4. *Hypericaceae* trib. *Hypericeae* 'sect'. *Androsaemineae* Spach, tom. cit. : 359 (1836); *nom. invalid.*
Hypericineae (2) *Hypericeae* (b) *Hypericeae genuinae* (β) *Androsaemeae* Reichenb., tom. cit. : 307 (1837) excl. parte.
Hypericum B. *Androsaeminae* (Spach) Endl., tom. cit. : 1033 (1840), *status ignot.*
Hypericaceae subfam. *Hypericoideae* trib. *Androsaemeae* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 20 (1951) 'Anrosaemeae'.
Hypericaceae subfam. *Hypericoideae* trib. *Hypericeae* Y. Kimura, tom. cit. : 21 (1951) pro parte.
 (Comprises *Campylopus* Spach, *Psorophytum* Spach, *Androsaemum* Duhamel, *Eremanthe* Spach, *Campylosporus* Spach, *Norysca* Spach, *Roscyna* Spach, *Takasagoya* Y. Kimura.)
5. *Hypericaceae* trib. *Hypericeae* 'sect.' *Brathydineae* Spach, tom. cit. : 364 (1836), *nom. invalid.*
Hypericineae (2) *Hypericeae* (b) *Hypericeae genuinae* (γ) *Brathydeae* Reichenb., tom. cit. : 308 (1837).
Hypericum C. *Brathydineae* (Spach) Endl., tom. cit. : 1033 (1840).
Hypericaceae subfam. *Hypericoideae* trib. *Sarothreae* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 : 23 (1951).
Hypericaceae subfam. *Hypericoideae* trib. *Ascyreae* Y. Kimura, tom. cit. : 24 (1951) pro parte.
 (Comprises *Myriandra* Spach, *Brathydium* Spach, *Brathys* Mutis ex L. f., *Sarothra* L., *Isophyllum* Spach.)
6. *Hypericaceae* trib. *Hypericeae* 'sect.' *Ascyrineae* Spach, tom. cit. : 368 (1836), *nom. invalid.*
Hypericineae (2) *Hypericeae* (a) *Ascyreae* Reichenb., tom. cit. : 307 (1837).
Hypericaceae subfam. *Hypericoideae* trib. *Ascyreae* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 (1951) excl. parte.
 (Comprises *Ascyrum* L.)
7. *Petalanisia* Raf., Fl. Tellur. 3 : 80 (1837).
Pleurenodon Raf., loc. cit. (1837).
 (Types of both genera unknown.)

TAXA EXCLUDED FROM *HYPERICUM*

Triadenum Raf. (in Medic. Reposit., N.Y., 2nd Hexadr., 5 : 352 (1808) *nom. nud.*), Fl. Tellur. 3 : 78 (1837), non *Triadenia* Spach (1836).

Gardenia Colden apud Garden in Ess. Obs. Phys. Lit. Edinb. 2 : 2 (1756) non *Gardenia* J. Ellis (1761), *nom. cons.*

Elodea sensu Pursh, Fl. Amer. Septentr. : 379 (1814), non *Elodea* Michaux, Fl. Bor.-Am. 1 : 20 (1803), nec sensu Juss., Gen. Pl. : 255 (1789) et Vent., Tabl. Regne Vég. 3 : 144 (1799), nec sensu Jack, Malayan Misc. 2 (7) : 25 (1822) et in Hooker's J. Bot. 1 : 371 (1834) pro parte, excl. typ. ; nec. *Elodes* Adanson, Fam. Pl. 2 : 444, 553 (1763). – Nutt., Gen. N. Amer. Pl. 2 : 17 (1818). – Spach in Annl. Sci. nat. sér. 2, Bot. 5 : 165, 353 (1836) ; Hist. Nat. Vég., Phan. 5 : 363 (1836).

Martia Sprengel, Anl. Kennt. Gewächse, ed. 2, 2 : 788 (1818), *nom. illegit.*, pro parte, quoad *H. virginicum* L. ; in L., Syst. Veg., ed. 16, 3 : 333 (1826) pro parte, quoad *M. petiolata* (Walter) Sprengel, *M. campanulata* (Walter) Sprengel.

Hypericum sect. *Elodea* Choisy, Prodr. Monogr. Hypér. : 37, 43 (1821) excl. *H. articulatum* Lam. ; in DC., Prodr. 1 : 546 (1824). – R. Keller in Engler & Prantl., Natürl. PflFam., 3 (6) : 209 (1893) ; op. cit., ed. 2, 21 : 175 (1925).

Thornea Breedlove & McClintock in Madroño 23 : 369 (1976).

Cratoxylum sect. *Tridesmos* (Choisy) Dyer in Hook. f., Fl. Brit. Ind. 1 : 258 (1874).

Hypericum sect. *Ascyreia* Choisy, Prodr. Monogr. Hypér. : 37, 38 (1821) pro parte, quoad *H. biflorum* Lam.

Elodea sensu Jack, Malayan Misc. 2 (7) : 25 (1822) ; in Hooker's J. Bot. 1 : 371 (1834) pro parte, excl. *E. aegyptica* (L.) Jack ('*Egyptiaca*').

Hypericum sect. *Tridesmos* Choisy in DC., Prodr. 1 : 546 (1824) excl. *H. articulatum* Lam.

Tridesmis Spach in Annl. Sci. nat., sér. 2, Bot. 5 : 351 (1836) ; Hist. Nat. Vég., Phan. 5 : 358 (1836) non *Tridesmis* Lour. (1790).

Cratoxylum sect. *Tridesmis* Engler & Prantl, Natürl. PflFam. 3 (6) : 216 (1893) ; op. cit., ed. 2, 21 : 184 (1925) '*Cratoxylon*'.

Eliea Cambess. in Ann. Sci. nat. 20 : 400, t. 13 (1830).

Hypericum sect. *Elodea* Choisy, Prodr. Monogr. Hypér. : 37, 43 (1821) pro parte, quoad *H. articulatum* Lam.

Hypericum sect. *Tridesmos* Choisy in DC., Prodr. 1 : 546 (1824) pro parte, quoad *H. articulatum* Lam.

PROVISIONAL KEY TO SECTIONS OF *HYPERICUM*

The following key to the sections of *Hypericum* enumerated above must, for reasons already given, be regarded as provisional. It is intended to be complementary to the evolutionary diagrams (Figs 3, 4) and the sectional synonymy and should enable most species to be allocated to a section. However, although the various parts of 'sect. *Euhypericum*' (i.e. Sects 8–19, 26–27) can be grouped fairly easily in their respective evolutionary lineages, it has not always proved easy to define these lineages or key them out. The parts of the key concerned with these groups should therefore be used with particular care.

Petals and stamens, or only petals (20. *Myriandra*, part), deciduous after anthesis* :

Black or red glands absent ; leaves decussate :

Stamens in fascicles ; styles free, spreading or \pm united ; perianth 5-merous :

Flowers homostyled ; stamen filaments free to near base :

Styles 5 (4) ; stem lines decurrent from leaf midrib stronger or present alone :

Bracteoles appressed to calyx ; styles 4 (5) ; stems and leaves verrucose

2. *Psorophytum*

Bracteoles not appressed to calyx ; styles 5 ; stem and leaves smooth :

Styles free or partly united ; anthers clearly dorsifixed 3. *Ascyreia*

Styles completely united ; anthers apparently basifixed 4. *Takasagoya*

Styles 3 ; stem lines decurrent from between leaves stronger or present alone

5. *Androsaemum*

Flowers heterostyled ; stamen filaments united to above middle 25. *Adenotrias*
(part)

Stamens in a continuous broad ring ; styles adpressed, apparently united ; perianth
5-4-merous 20. *Myriandra*

Black or red glands present on sepal and sometimes petal margin ; leaves in whorls of 3-4

19. *Coridium*

(part)

Petals and stamens persistent after anthesis :

Stamens in a continuous narrow ring (or irregularly arranged when few) ; black or red glands
absent ; placentation parietal ; stem 4-lined or 4-winged, at least when young :

Flowers solitary or rarely 2-4 ; plant often branching pseudo-dichotomously ; leaf margin
flat or incurved to involute, or very rarely revolute ; shrubs or wiry shrublets, usually
with short internodes 29. *Brathys*

Flowers \pm numerous, in dichasial to monochasial cymes, or solitary by reduction ; leaf
margin flat or recurved to revolute, or very rarely involute ; suffrutices or perennial to
annual herbs, rarely with short internodes 30. *Spachium*

Stamens in fascicles or irregularly arranged ; other characters not correlated as above :

Styles appressed (at the base at least) or \pm united, mostly 5 :

Plant a tree or shrub ; black glands often present 1. *Campyloporus*

Plant an erect perennial herb ; black glands absent :

Styles 5 (4) ; stamen fascicles 5 (4) ; leaves free 7. *Roscyna*

Styles 3 ; stamen fascicles 3 ; leaves perfoliate 8. *Bupleuroides*

Styles free, spreading or ascending, not appressed, mostly 3 :

Stamen fascicles 5 ; styles 3 ; broad-leaved shrub without black glands 6. *Inodora*

Stamen fascicles 3-4 or stamens irregular or, if fascicles 5, then styles 5 and plant
herbaceous or a shrub with black glands :

Seeds \pm flattened or convolute or carunculate at one end, with testa linear-punctulate ;
shrubs or sclerophyllous shrublets, mostly without black glands :

Leaves with dense tertiary reticulate venation ; style bases not contiguous :

Plant a shrub c. 1.3-4 mm tall ; leaves \pm narrowly lanceolate, \pm acute ; older
stem-nodes not swollen 21. *Webbia*

Plant a low rounded shrub up to c. 0.5 m tall ; leaves broadly lanceolate to
obovate or subcircular, obtuse to rounded ; older stem-nodes \pm swollen

22. *Arthrophyllum*

Leaves without visible tertiary reticulate venation (with or without pinnate
secondary venation) ; style bases contiguous, though not appressed :

Leaves rounded, pinnately veined, \pm discolorous, usually petiolate ; young
stems reddish 23. *Triadenioides*

* Cf. also 1. *Campyloporus* (sometimes tardily deciduous in *H. socotranum* Good and *H. quartinianum* A. Rich.).

Leaves acute to obtuse, 1-veined, concolorous, sessile ; young stems yellowish :
 Flowers homostyled ; stamen filaments free to near base ; petals without
 nectariferous appendage ; lodicules absent 24. *Heterophylla*
 Flowers heterostyled ; stamen filaments united to above middle ; petals with
 nectariferous appendage ; 3 lodicules present at base of ovary

25. *Adenotrias*
 (part)

Seeds tapering or rounded at both ends, with testa variously patterned ; shrubs to
 herbs, almost always with black glands :

Stamens in 3-5 obscure fascicles or irregularly arranged ; styles 3-5 ; flowers
 usually solitary at ends of branches or in irregular cymes (i.e. mixed cymes and
 foliate branches) ; sepals nearly always entire with apex obtuse to rounded

26. *Humifusoideum*

Stamens in 3 (rarely 4-5) definite fascicles ; styles 3 (rarely 4-5) ; flowers nearly
 always in regular cymes (sometimes reduced to one flower) ; sepals entire or not,
 apex various :

Sepal marginal glands (nearly always present) flat-topped or (when sessile)
 elongated along sepal margin ; stems, if herbaceous, terete ; petals often
 without superficial pale glands :

Petals without nectariferous appendage ; stamen filaments free nearly to base ;
 lodicules absent 27. *Adenosepalum*

Petals with trifid nectariferous appendage ; stamen filaments united to above
 middle ; 3 lodicules present at base of ovary 28. *Elodes*

Sepal marginal glands absent or round-topped or (when sessile) round or, if flat-
 topped (17. *Hirtella*, part), then stem 2-lined ; petals almost always with
 superficial pale glands :

Seeds with testa reticulate to linear-foveolate ; petals entire or with sessile
 marginal glands, without glandular cilia ; plant glabrous or rarely leaves
 papillose 9. *Hypericum*

Seeds with testa smooth or rugulose to papillose or ribbed or, if reticulate to
 linear-foveolate, then petals with some glandular cilia ; plant often
 \pm pubescent :

Seeds with testa \pm papillose ; anther gland amber ; black glands usually
 confined to margins of sepals and petals (or petals entire), usually absent
 from leaves or rarely terminal or forming an intramarginal row :

Petals \pm unguiculate, rarely red-tinged or red-veined, with pellucid
 glandular dots or short streaks only ; stems not creeping or rooting

17. *Hirtella*

Petals not unguiculate, usually \pm red-tinged or red-veined, with pellucid
 glandular lines (sometimes also a few dots or streaks) or without
 pellucid glands ; stems creeping, often rooting :

Leaves paired ; capsule valves longitudinally vittate 18. *Taeniocarpium*

Leaves in whorls of 3-4 ; capsule valves usually with some lateral
 vesicles 19. *Coridium*
 (part)

Seeds with testa reticulate or foveolate to rugulose or ribbed ; anther gland
 black (except in 16. *Crossophyllum*, part) ; black glands on sepals,
 petals and leaves, frequently laminar or forming an intramarginal row,
 very rarely wholly absent (16. *Crossophyllum*, part) :

Sepals entire or rarely eroded-subentire, without marginal or intramarginal
 black glands (sometimes with superficial ones) :

Stem, leaves and sepals glabrous ; capsule erect 10. *Olympia*

Stem, leaves and sepals pubescent ; capsule pendulous 11. *Campylopus*

- Sepals gland-fringed or eglandular-fringed or, if entire, then with intramarginal black glands :
- Capsule valves with vesicles and/or interrupted vittae or almost smooth ; seeds with testa scalariform-ribbed or rugulose or rarely minutely foveolate :
- Seeds with testa scalariform-ribbed or rarely minutely foveolate ; stem usually terete ; plant glabrous or rarely with leaves setose beneath 13. *Drosocarpium*
- Seeds with testa rugulose or rarely faintly ribbed or minutely foveolate ; stem 2-lined ; plant often \pm pubescent 12. *Origanifolium*
- Capsule valves longitudinally vittate or rarely with vittae slightly interrupted ; seeds with testa reticulate-foveolate to linear-foveolate :
- Leaves all gland-fringed, auriculate ; styles 3 16. *Crossophyllum*
- Leaves entire or only uppermost gland-fringed (and then styles 5), not auriculate :
- Styles and stamen fascicles 5 ; sepals glandular fimbriate 15. *Thasia*
- Styles and stamen fascicles 3 or rarely 5, but then sepals entire or subentire 14. *Oligostema*

SUMMARY

An outline of the previous classifications of *Hypericum* and related genera is given, followed by a discussion of problems raised by discrepancies between the various systems. It is concluded that :

(1) The tribes Vismieae, Cratoxyleae and Hypericeae are better treated as a subfamily (or possibly as subfamilies) of the Guttiferae or Clusiaceae (Hypericoideae) than as a separate family (Hypericaceae).

(2) The floral anomalies of *Hypericum elodes* L. and the *H. aegypticum* L. group of species are modifications related to specialized insect pollination, and these species should be included in *Hypericum*, not placed in separate genera.

(3) *Hypericum* sect. *Elodea* comprises herbaceous species derived from *Cratoxylum* Blume and should therefore be treated as a separate genus, *Triadenum* Raf.

(4) The flower of *Hypericum* basically has 5 antepetalous stamen fascicles, which have undergone various modifications during the evolution of the genus.

(5) The species with a tetramerous perianth (*Ascyrum* L.) are neither distinct from *Hypericum* nor a monophyletic group and should be included in two quite separate sections of *Hypericum*.

(6) The type species of *Elodes* Adanson is *Hypericum elodes* L. (*Elodes palustris* Spach), not *H. aegypticum* L. *Elodea* Juss. (1789) is an orthographic variant of *Elodes*, not a distinct generic name, and hence does not threaten *Elodea* Michaux (1803).

The relationships and some evolutionary trends in *Hypericum* as thus defined are discussed and tentative diagrams illustrating the evolution of the genus are given.

A provisional sectional classification of *Hypericum* with complete synonymy is elaborated, along with type species, distribution, approximate number of species, and chromosome number(s). The 30 sections recognized are keyed out.

ACKNOWLEDGEMENTS

The help of various colleagues and friends at the British Museum (Natural History) and the Royal Botanic Gardens, Kew, who have assisted with nomenclatural and bibliographical matters and Greek translation, as well as in discussion of more general topics, and of Mrs Ann Davies, who drew the diagrams, is gratefully acknowledged.

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INDEX

In this index the names of taxa of a rank between family and genus are listed under the family name Hypericaceae, in separate alphabetical series for the tribes, the 'sections', a term misapplied by Spach, and those of unspecified rank. Similarly, under the various generic names, the epithets of taxa of lower rank are listed in separate alphabetical series for each rank, with those applying to subdivisions of genera of unspecified rank listed immediately before those of species, from which they can be distinguished by the fact that they start with capital letters.

The names that are treated as synonyms in this work are printed in italics in this index. Various of the specific names in *Hypericum* not so treated here will be regarded as synonyms in later detailed treatments of the individual sections. Page numbers in bold type indicate the entry for the taxon as to its type, or, in the case of species, the place of listing as a member of a particular section.

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