NOTES ON MALESIAN SPECIES OF HYPERICUM (GUTTIFERAE)

Florae Malesianae Praecursores LII

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This paper includes descriptions of new taxa that will be treated in *Flora Malesiana*, as well as comments on the distribution, morphology, or nomenclature of some of the other species. In all, 15 species, belonging to six sections, are recognised as natives of the Flora area, in addition to the introduced *H. monogynum* L. (*H. chinense* L.), which has long been cultivated there. The affinities, both systematic and geographical, of the Malesian species are very varied and pose some interesting problems of phytogeography.

1. HYPERICUM MONOGYNUM L.

Hypericum monogynum L., Sp. Pl., ed. 2 (1763) 1107; Miller, Gard. Dict., ed. 8 (1768) No. 11. — [*H. monogynum* Miller, Gard. Dict., ed. 7 (1759) No. 11; Figs. Pl. Gard. Dict. 2 (1760) 101, t. 151, f. 2, *nom. invalid.*] — *H. chinense* L., Syst. Nat., ed. 10, 2 (1759) 1184; Diss. exhib. C. N. Hellenius: 6 (1776); Amoen. Acad. 8 (1785) 323; Robson in Journ. R.H.S. 95 (1970) 483, 489; *non* Osbeck, Dagbok Ostind. Resa (1757) 244. — *Norysca chinensis* Spach in Hist. Nat. Vég., Phan. 5 (1836) 427; Ann. Sci. Nat., sér. 2, Bot. 5 (1836) 364. — *Norysca punctata* Blume, Mus. Bot. Lugd. Bat. 2 (1856) 23. — Type: Miller, Figs. Pl. Gard. Dict. 2, t. 151 f. 2 (plate and specimen dated 1757) (BM, topotype).

Hypericum aureum Lour., Fl. Coch. 2 (1790) 472. — *Norysca aurea* Blume, Mus. Bot. Lugd. Bat. 2 (1856) 22. — Type: China, Canton, cultivated (unlocated).

Hypericum salicifolium Sieb. & Zucc., Abh. Akad. Münch. 4, 2 (1843) 162. — *H. monogynum sensu* Thunb., Fl. Jap. (1784) 297. — *H. chinense* var. *salicifolium* Choisy in Zoll., Syst. Verz. Ind. Archip. 1 (1854) 150. — *Norysca salicifolia* Blume, Mus. Bot. Lugd. Bat. 2 (1856) 23. — *H. chinense* [subsp.] *β salicifolium* Kuntze, Rev. Gen. Pl. 1 (1891) 60. — *Komana salicifolia* Y. Kimura *ex* Honda, Nomina Pl. Jap. (1939) 222. — *Norysca chinensis* var. *salicifolia* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 (1951) 107. — Type: Japan, 'Crescit in Miaco, Osakka, alibi, saepius cultum ob pulchritudinem florum'. *Thunberg* (UPS).

Hypericum chinense [subsp.] *α obtusifolium* Kuntze, Rev. Gen. Pl. 1 (1891) 60. — Type: India, 'Calcutta' (cultivated) (NY).

Hypericum chinense [subsp.] *γ latifolium* Kuntze, Rev. Gen. Pl. 1 (1891) 60. — Type: Taiwan, 'Formosa' (NY).

Merrill, in Amer. J. Bot. 3 (1916) 588, was the first to draw attention to Osbeck's prior use of the epithet *chinense*; but he apparently took the earlier description to refer to the Linnaean species, which is a shrub. In fact, however, Osbeck described a herbaceous plant with four-angled stems, which he differentiated from *Hypericum quadrangulum* L. The only herbaceous species with four-angled stems that occurs in the region of Canton

(whence Osbeck's plant came) is *H. japonicum* Thunb. *ex* Murr., Syst. Veg. ed. 14 (1784) 702, a well-known plant with a wide distribution in eastern Asia and Australasia. Searches in Sweden, England, and Portugal, however, have failed to reveal Osbeck's specimen and, rather than create a future *nomen ambiguum* by transferring the epithet *chinense* from one well-known species to another, I prefer to regard *H. chinense* Osbeck as a name of doubtful application. This name must nevertheless be taken into account in questions of priority, and it is therefore regrettably necessary to replace one Linnaean name (*H. chinense* L., 1759) by another (*H. monogynum* L., 1763). Linnaeus, in his description of the latter species, cited Miller's name (1760) published in a work that includes polynomials, without any reference to his own *H. chinense*, although both are based on Miller's illustration (drawn 1757, published 1759).

The variability of *H. monogynum* has led several authors to subdivide this species. Apart from Kuntze, Rev. Gen. Pl. 1 (1891) 60, whose three taxa prefixed by Greek letters should be taken as subspecies, they have all recognised two entities, as either species or varieties. One of these, with larger acute leaves, larger more numerous flowers, and a more inland distribution in China, has been distinguished as *H. salicifolium* Sieb. & Zucc., *H. chinense* var. *salicifolium* Choisy, etc. It is the form that is commonly cultivated in Japan. The other entity, with smaller, obtuse to rounded leaves and fewer smaller flowers, is confined to Kwangtung Province and adjacent areas. From this region, however, it has been introduced to many parts of the world, and has become the commonest form in cultivation outside Japan. It has been known as, for example, *H. chinensis* var. *chinensis* or *H. chinensis* subsp. *obtusifolium* Kuntze. The variation in *H. monogynum*, however, appears to be continuous over its natural range in China and Taiwan, so that it is impossible to recognise any subspecific taxa. Indeed, Kuntze's subsp. *latifolium*, from Taiwan, falls within the intermediate range of variation. Even if the two extremes were distinguishable as species, they could not be named *H. chinense* L. and *H. monogynum* L. respectively, as Hasskarl, Pl. Jav. Rar. (1848) 278 did, because these names are based on the same type, Miller's illustration.

Blume's epithet *punctata* refers to the black dots which, according to Choisy (in DC., Prodr. Syst. Nat. Veg. 1 (1824) 545), occur on the leaves and sepals. Blume, seeing no black dots on typical *H. monogynum*, thought that Choisy must have described a different species. The rest of Choisy's description, however, applies to *H. monogynum*, and so it must be assumed that he, like several later workers, was misled by darkened contents of some pellucid glands.

2. HYPERICUM SECT. TAKASAGOYA (Y. KIMURA) N. ROBSON

Hypericum sect. **Takasagoya** (Y. Kimura) N. Robson, *stat. nov.*

Hypericum sect. *Norysca sensu* R. Keller in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 21 (1925) 176, *pro min. parte.*

Takasagoya Y. Kimura, Bot. Mag. Tokyo 50 (1936) 498; in Nakai & Honda, Nova Fl. Jap. 10 (1951) 85.

Kimura's genus *Takasagoya* comprised seven species said to be endemic to Taiwan, but the actual number is four, of which one occurs also in the Philippines (Luzon).

This group of species was separated by Kimura from those of sect. *Ascyreia* Choisy (sect. *Norysca* R. Keller) on account of their having completely united styles and basifixed anthers, whereas in sect. *Ascyreia* the styles are never completely united and the anthers, as in the rest of *Hypericum*, are versatile. *Takasagoya*, however, is obviously a development from the group of Chinese species of Sect. *Ascyreia* consisting of *H. monogynum* L., *H.*

prattii Hemsley, and *H. longistylum* Oliver, all of which have long styles united almost to the apex. In addition, *H. longistylum* has an elongate inflorescence of axillary flowers, a character that is unusual elsewhere in *Hypericum* but characteristic of *Takasagoya*.

There remains the question of the basifixed anther which, although a small development from the usual condition, might, if shown to be constant, to be taken to warrant generic segregation. My observations, however, show that there is no fundamental distinction between the two forms of anther insertion. In both, the filament narrows at the apex; but, whereas in the rest of *Hypericum* (including the *H. monogynum* group) it is inserted slightly below the middle of the connective, in the species of sect. *Takasagoya* it is inserted nearer the base of the connective — but not actually at it. As the anthers of these species are smaller and less elongated than those of the *H. monogynum* group, it seems that we are here dealing with a question of heterogonic growth, not a change in the point of insertion of the filament, i.e. the change of anther shape makes the insertion appear nearly basal, whereas morphologically it has not altered.

The essential differences between *Takasagoya* and *Hypericum* are thus reduced to (i) styles completely united as opposed to almost united and (ii) anthers relatively shorter. Since neither of these differences is fundamental, it seems preferable to treat the *Takasagoya* group as a section of *Hypericum* than as a separate genus. Sect. *Takasagoya* includes the following species:

1. Hypericum formosanum Maxim., Bull. Acad. Petersb. 27 (1882) 428; Mel. Biol. 11 (1882) 160. — *Takasagoya formosana* Y. Kimura, Bot. Mag. Tokyo 50 (1936) 499, fig. 1 3a-i. — Type: Taiwan, Prov. Taipei (Taihoku), prope Tamsuy, *Oldham 31* (BM!, K!).

2. Hypericum nakamurai (Masamune) N. Robson, *comb. nov.* — *Takasagoya nakamurai* Masamune, Trans. Nat. Hist. Soc. Formosa 30 (1940) 410. — Type: Taiwan, Prov. Hualien (Karenkyo-tyo), Karen-gun, Mt. Seisuizan, *c.* 2000 m, 9—9—1939, *T. Nakamurai 3734* (TAI!).

3. Hypericum subalatum Hayata, Journ. Coll. Sci. Tokyo 30, 1 (1911) 41; Icon. Pl. Formos. 1 (1911) 77. — *Takasagoya subalatum* Y. Kimura, Bot. Mag. Tokyo 50 (1936) 501, fig. 2. — Type: Taiwan, Prov. Taipei (Taihoku), Kussyaku, secus rivulos, 8—4—1903, *Faurie 115* (BM!, E!, TI! holo.).

Hypericum kushakuense R. Keller, Bot. Jahrb. 58 (1923) 191. — Type: as for *H. subalatum* (B † holo.).

4. Hypericum geminiflorum Hemsley, Ann. Bot. 9 (1895) 144. — *Takasagoya geminiflora* Y. Kimura, Bot. Mag. Tokyo 50 (1936) 501, fig. 2. — Type: Taiwan, Prov. Kaohsiung (Takao), Apes Hill, *Henry 1155* (K!).

Hypericum trinervium Hemsley, Ann. Bot. 9 (1895) 144. — *Takasagoya trinervia* Y. Kimura, Bot. Mag. Tokyo 50 (1936) 503. — Type: Taiwan, Prov. Pintung (Takao), South Cape, *Henry 906* (K! lecto.), 906A (K!).

Hypericum loheri Merrill, Philipp. J. Sci., ser. C., 4 (1909) 294. — Type: Philippines, Luzon, Benguet Prov., Ambuklao, *Loher 66* (K! lecto., US!); Benguet Prov., Mt. Ugo, *Ramos BS 5716* (US!); Zambales Prov., Pinatubo, *Foxworthy BS 2562* (US!).

Hypericum acutisepalum Hayata, J. Coll. Sci. Tokyo 30, 1 (1911) 308; Icon. Pl. Formos. 1 (1911) 77, t. 15. — *Takasagoya acutisepala* Y. Kimura, Bot. Mag. Tokyo 50 (1936) 501, fig. 3 j-o. — Type: Taiwan, Prov. Taitung (Taityû), Nanto, *Kawakami 3245* (TI!).

? *Hypericum pustulosum* R. Keller in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 21 (1925) 176. — Type: 'Aus dem ostasiatischen Tropengebiet'.

Hypericum lackeyi Elmer, Leafl. Philipp. Bot. 9 (1934) 3190. — Type: Philippines, Luzon, Pampanya Prov., Zambales Mts., Mt. Pinatubo, Camp Stotsenburg, *Elmer 21989* (BM!, BO!, GH!, K!, PNH! holo, SING!).

H. geminiflorum is rather variable, but I have been unable to separate the three Taiwan 'taxa' from each other or from the Philippine plants. The type specimens of those in Taiwan look distinct at first glance, but the variation in other specimens, especially if those from the Philippines are included, makes it clear that only one species is distinguishable.

One particular variant of *H. geminiflorum*, however, may deserve taxonomic recognition. It grows at higher altitudes, has shorter styles, and is often smaller in other parts as well. Hayata and Kimura both recognised it as a species, but in my opinion it is not worth more than varietal rank. Indeed, future observations in the field may well show that it intergrades with the typical variety. Nevertheless, at present it is desirable to make the following change of rank:

4a. Hypericum geminiflorum var. **simplicistylum** (Hayata) N. Robson, *stat. nov.* — *Hypericum simplicistylum* Hayata, Journ. Coll. Sci. Tokyo 30, 1 (1911) 41. — *Takasagoya simplicistyla* Y. Kimura, Bot. Mag. Tokyo 50 (1936) 502, fig. 3 r-s. — Type: Taiwan. Nôkôzan, ad 1800 m alt., *Kawakami & Mori 4507* (TI!).

The species of sect. *Takasagoya* may be differentiated by the following key:

1. Sepals 3.5—10 mm long, mostly lanceolate or narrowly elliptic to linear, often with midrib; flowers from up to 6 nodes below apex.
   2. Stems terete when mature; leaves ovate to elliptic or obovate, subacute to rounded.
      3. Petals 10—20 mm long; sepals 7—10 mm long, obovate to lanceolate; leaves ovate to elliptic, 2—6 mm long . . . . . **1. H. formosanum**
      3. Petals 20—28 mm long; sepals 3.5—8 mm long, linear-lanceolate to linear; leaves elliptic to obovate, 1—2.1(3.5) mm long . . . . . **2. H. nakamurai**
   2. Stems 4-angled to 4-winged when mature; leaves usually narrowly elliptic to lanceolate, acute to subacute . . . . . **3. H. subalatum**
1. Sepals 1—3 mm long, mostly broadly ovate to oblong, without midrib; flowers from up to 14 nodes below apex.
   4. Styles 1.3—2 × as long as the ovary; sepals 1—2.5 mm long; branches often spreading and pendulous **4. H. geminiflorum** var. **geminiflorum**
   4. Styles about as long as the ovary; sepals 2.5—3 mm long; branches erect or ascending **4a. H. geminiflorum** var. **simplicistylum**

3. HYPERICUM SEWENSE N. ROBSON

Hypericum sewense N. Robson, *sp. nov.* (Sect. *Humifusoideum* R. Keller)

H. macgregorii F. Muell. affinis sed foliis longioribus, lanceolatis vel anguste ellipticis, patulis vel adscendentibus, placentis parietalibus, stylis longioribus, differt; a *H. saruwagedico* Diels foliis magnis patulis vel adscendentibus margine haud incurvatis, stylis longioribus, differt.

Frutex glaber erectus 0.6 m altus, ramis divaricato-adscendentibus. *Ramuli* primo quadrilineati plano-compressi, mox bilineati, deinde teretes. *Folia* sessilia; lamina 0.8—1.2 × 0.2—4 cm, lanceolata vel anguste elliptica, apice rotundata basi anguste cuneato-amplexicaulia, concolora, plana, patula vel adscendentia, venis primus lateralibus c. 5, plerumque e venis basalibus curvatis enascentibus, plusminusve parallelis, distaliter versus marginem tantum ramosis, venatione haud valde reticulata glandulae laminares pallidae, prope basin lineares, interdum utrinque seriatim striis vel punctis ornatae, versus apicem marginemque

punctatae; glandulae intramarginales pallidae vel nigrae. *Inflorescentia* 1-florata, terminalis, ex axillis supremis sine ramulis floratis vel rare ramulo florato singulo instructa, ex axillis inferioribus numerosis ramulis instructa; pedicelli foliis supremis brevi, in stato fructifero 4—8 mm longi. *Flores* 2.2—2.8 mm in diam., plusminusve planae, in alabastro anguste ovoideae subacutae. *Sepala* 5—7 × 1.5—2.5 mm, libera imbricata lanceolata, apice rotundata vel subacuta, margine integra, glandulis laminaribus pallidis pro parte maxima linearibus, glandulis submarginalibus pallidis vel interdum nigris. *Petala* lutea, 10—14 × 5—6.5 mm, obovata, post anthesin persistentia, apiculo laterali obsoleto, margine integra, glandulis laminaribus pallidis linearibus petali apicem versus interdum interruptis, glandulis submarginalibus nullis vel in vel prope apiculo glandulis 1—4 sessilibus nigris ornata. *Stamina* c. 20, 3-fasciculata, fasciculis vix conjunctis, staminibus longissimis 8—9 mm longis, petalis circa tertia parte brevioribus, post anthesin persistentia; anthera lutea connectivi glandula nigra. *Ovarium* 2.5—3 mm longum, ovoideum; styli 3, 2.5—3 mm longi, ovarium aequantes, divergentes, stigmatibus vix capitatis; placentae 3, parietales. Capsula 7—9 × 4—5 mm, ovoidea, longitudinaliter vittata. *Semina* testacea, c. 0.8 mm longa, cylindrica, vix carinata, testa dense seriatim foveolata.

Typus: New Guinea: Madang District, Saidor Sub-District, Finisterre Mountains, Naho-Rawa Divide, Sewe, Lake Naho, c. 2700 m, 13—11—1964, *Sayers N.G.F. 21418* (BM holo!, L!).

Notes: As the above collection is the only one of this species made so far, it would appear that *H. sewense* is very local. It is a very interesting species because, while its affinities in one direction are clearly with *H. macgregorii*, *H. bifurcatum*, and *H. papuanum* — and therefore, through the last species, with the advanced numbers of sect. *Humifusoideum* in Africa and Madagascar — it also shows a considerable resemblance to *H. revolutum* Vahl (sect. *Campylosporus*) from Africa, Madagascar, and the Mascarenes Islands (e.g. the narrow crowded leaves and the much-branched stems with branches terminating in solitary flowers). The differences from *H. revolutum* (e.g. dwarfer habit, shorter laminar leaf glands, smaller flowers, stamens fewer and not in distinct fascicles, placentation parietal, styles fewer and spreading) all show developments in the direction of the other members of sect. *Humifusoideum*.

4. HYPERICUM MACGREGORII F. v. MUELL.

Hypericum macgregorii F. v. Muell., Trans. Roy. Soc. Victoria 1, 2 (1889) 12.

In Papua and New Guinea this species occurs in three districts — Morobe, Central, and Milne Bay — but, whereas most of the specimens from these districts have relatively narrow leaves (leaf index 2.5—3.5) with a subacute apex and pedicels 2—6 mm long in fruit, the population on Mt. Maneao (Milne Bay District) has relatively broader leaves (leaf index 2.2—3.1) with a more rounded apex and pedicels 5—10 mm long in fruit. Although it seems neither possible nor desirable to distinguish these two variants taxonomically, there is one gathering from near Lake Habbema (*Brass 10660*) at the other end of New Guinea that differs from the Mt. Maneao population only in details of the glands. Despite the immense distance between Lake Habbema and the nearest population of typical *H. macgregorii* in Morobe District (let alone that between Lake Habbema and Mt. Maneao), I propose to describe the Brass collection as a subspecies of *H. macgregorii* rather than as a distinct species. If it had been found near other populations of that species, it would almost certainly have been regarded as indicating an extension of the specific variation, rather than put in a separate species; and the wide disjunction, to my mind, does not, of itself, make the Lake Habbema population worthy of specific rank.

Subsp. **macgregorii.** — Folia glandulis laminaribus linearibus vel versus marginem interrupte linearibus vel punctatis, glandulis intramarginalibus semper pallidus.

Typus: New Guinea: Central District, summit of Owen Stanley Range, 3900 m, 1889, *Macgregor* (BM!, K!, MEL holo!, SING!).

Subsp. **punctatum** N. Robson, *subsp. nov.* — Folia glandulis laminaribus pro parte maxima punctis vel striis brevibus, glandulis intramarginalibus interdum nigris.

Typus: New Guinea: West N. Guinea, 6 km N.E. of Lake Habbema, 3000 m, –10–1938, *Brass 10660* (A!).

5. HYPERICUM BIFURCATUM N. ROBSON

Hypericum bifurcatum N. Robson, *sp. nov.* (Sect. *Humifusoideum* R. Keller).

H. papuano Ridley affinis sed floribus semper solitariis atque ex axillis supremis, ramulis floratis instructis, stylis semper 3, foliis glandulis pellucidis punctiformibus lateralibus seriatim dispositis, differt.

Frutex glaber erectus (? vel herba lignosa) 0.3—1.5 m altus, ramis plusminusve strictis. *Ramuli* primo bilineati, deinde teretes. *Folia* sessilia; lamina 0.7—1.3 (—1.6) × 0.15—0.6 cm, anguste ovata vel anguste elliptico-oblonga, apice rotundata basi cuneata vel rotundata, concolora, plana, adscendentia vel adpressa, venis primis lateralibus c. 7, plerumque e venis basalibus curvatis enascentibus, plusminusve parallelis, pauce ramosis, prope marginem apicemque conjunctis, venatione haud valde reticulata; glandulae laminares pallida lineares interdum utrinque seriatim punctis ornatae, versus marginem plusminusve interruptae; glandulae intramarginales pallidae tantum. *Inflorescentia* 1-florata terminalis, ex axillis supremis ramulis floratis validis, e proxime inferne axillis ramulis floratis invalidioribus saepe instructa, ramificationi repetita bifurcationi simili, pedicelli folia suprema aequantes vel superantes, in stato fructifero 8—15 mm longi. *Flores* 1.5—2.5 mm in diam., plusminusve planae, in alabastro anguste ovoideae rotundatae. *Sepala* 4—6 × 1.5—2 mm, libera imbricata ovato-lanceolata, apice subacuta, margine integra, glandulis laminaribus pallidis, omnibus vel pro parte maxima linearibus, glandulis submarginalibus pallidis vel rubentibus. *Petala* lutea, extus aurantio- vel rubrotincta, 9—14 × 3—5 mm, obovata vel oblanceolata, post anthesin persistentia, apiculo laterali nullo vel obsoleto, margine integra, glandulis laminaribus pallidis linearibus, petali apicem versus interdum interruptis, glandulis submarginalibus nullis vel in apiculo glandulo uno sessile rubenti ornata. *Stamina* obscure 3-fasciculata, fasciculis vix conjunctis, staminibus 25—35 longissimis 6—8 mm longis, petalis circa quarta parte brevioribus, post anthesin persistentia; anthera lutea connectivi glandula nigra. *Ovarium* 2 mm longum, ovoideum; styli 3, 2 mm longi, ovarium aequantes, divergentes, stigmatibus anguste capitatis; placentae 3, parietales. *Capsula* 6–9 × 3.5–4.5 mm, plusminusve late vel anguste ovoidea vel ovoideo-pyramidalis, longitudinaliter vittata. *Semina* testacea, c. 0.7 mm longa, cylindrica vel cylindrico-ellipsoidea, leviter carinata, testa dense seriatim foveolata.

Typus: New Guinea: Morobe District, Huon Peninsula, Cromwell Mountains, Mannasat, *c.* 2340 m, 9–8–1964, *Hoogland 9542* (BM holo!, CANB!, K!, L!).

Notes: *H. bifurcatum* appears to be confined to the Morobe District (Cromwell Mts., *Hoogland 9542*; Sarawaged Mts., *Hartley 13240*, *Clemens 5300*, *5646*; Busu R., *Clemens 6268*; Samanzing, *Clemens 9334A*) and Eastern Highlands District, Goroka Sub-District (Marafunga, *Millar & van Royen NGF 15969*, *Kairo NGF 21121*, *Hartley 13240*; Daulo, *McKee 1501A*, *Womersley, Floyd & McKee 6099*). Its affinities are clearly with *H. sewense* N. Robson and *H. papuanum* Ridley (syns. *H. hellwigii* Lauterb., *H. habbemense* A. C.

Smith); but it differs from the former *inter alia* in having flowering shoots in the uppermost leaf axils, relatively broader ± imbricate (not spreading) leaves with only pale marginal glands, and smaller flowers. From *H. papuanum* it can nearly always be distinguished by the paired flowering shoots in the uppermost axils; but on the rare occasions that this character is present in *H. papuanum*, the leaf laminar glands do not have the pattern of lines of dots flanking each line that is characteristic of *H. bifurcatum*. In addition, *H. bifurcatum* always has 3 styles, whereas in *H. papuanum* the number varies from 3 to 5.

6. HYPERICUM SECT. HUMIFUSOIDEUM R. KELLER

With the discovery that the above section occurs in New Guinea, it becomes necessary once again to emend its circumscription, the author having already pointed out that other African species besides Keller's original one (*H. peplidifolium* A. Rich.) should be included in it (Robson in Kew Bull. 3, 1958, 436) and listed a total of six. Subsequent work has shown that three of these (*H. kiboense* Oliv., *H. conjungens* N. Robson*, and *H. aethiopicum* Thunb.) have other affinities and must be excluded from sect. *Humifusoideum*. At present, therefore, this section includes the following species:

1) *H. sewense* N. Robson, *sp. nov.* (New Guinea).
2) *H. macgregorii* F. v. Muell., Trans. Roy. Soc. Victoria 1, 2 (1889) 12 (New Guinea).
3) *H. saruwagedicum* Diels, Bot. Jahrb. 62 (1929) 482 (New Guinea).
4) *H. bifurcatum* N. Robson, *sp. nov.* (New Guinea).
5) *H. papuanum* Ridley, Trans. Linn. Soc., ser. 2, Bot. 9 (1916) 19 (New Guinea).
6) *H. natalense* Wood & Evans, Journ. Bot. (London) 35 (1897) 487 (Natal, eastern Cape Province).
7) *H. wilmsii* R. Keller, Bull. Herb. Boiss., sér. 2, 8 (1908) 179 (Cape Province, Natal, Transvaal, Rhodesia, Madagascar).
8) *H. peplidifolium* A. Rich., Tent. Fl. Abyss. 1 (1847) 95 (Ethiopia and Sudan Republic to Mozambique, Rhodesia, Zambia, and Angola; also in Cameroons and Fernando Po).

The revised diagnosis is as follows:

Hypericum L. sect. **Humifusoideum** R. Keller *emend.* N. Robson.

Fructices vel herba glabri; caules teretes vel 2—4-lineati, eglandulares vel raro nigro-punctata. *Glandulae nigrae* in caulibus foliis sepalis petalis antherisque interdum adsunt. *Glandulae pallides* plerumque magnae saepe prominentes. *Inflorescentia* 1-florata ex axillio supremis ramulis floratis interdum instructa vel cymosa vel ramulosa cymosaque intermixta. *Sepala* integra plerumque obtusa vel rotundata. *Petala* cum staminibus persistentia, sine glandulis laminaribus nigris. *Stamina* obscure 3—5-fasciculata vel haud fasciculata. *Ovarium* 3—5-loculare placentis axillaribus vel 1-loculare placentis 3—5 parietalibus vel intrusis; styli 3—5 (6, fide A. C. Smith), stigmata haud vel leviter capitata. *Capsula* 1 vel 3—5-locularis, valvis longitudinale vittatis, vel raro baccata indehiscens. *Semina* cylindrica haud alata haud vel leviter carinata, testa lineare foveolata vel scalariforme reticulata.

Typus sectionis: *H. peplidifolium* A. Rich.

The suggested affinities of these species are shown in Fig. 1.

The close phytogeographical connections thus proposed between Africa, Madagascar and the Mascarene Islands on the one hand and New Guinea on the other are unusual, to say the least. The morphological trends, however, are quite clear, and one can only

[1]) *H. conjunctum* N. Robson (1958) *non* Y. Kimura (1938).

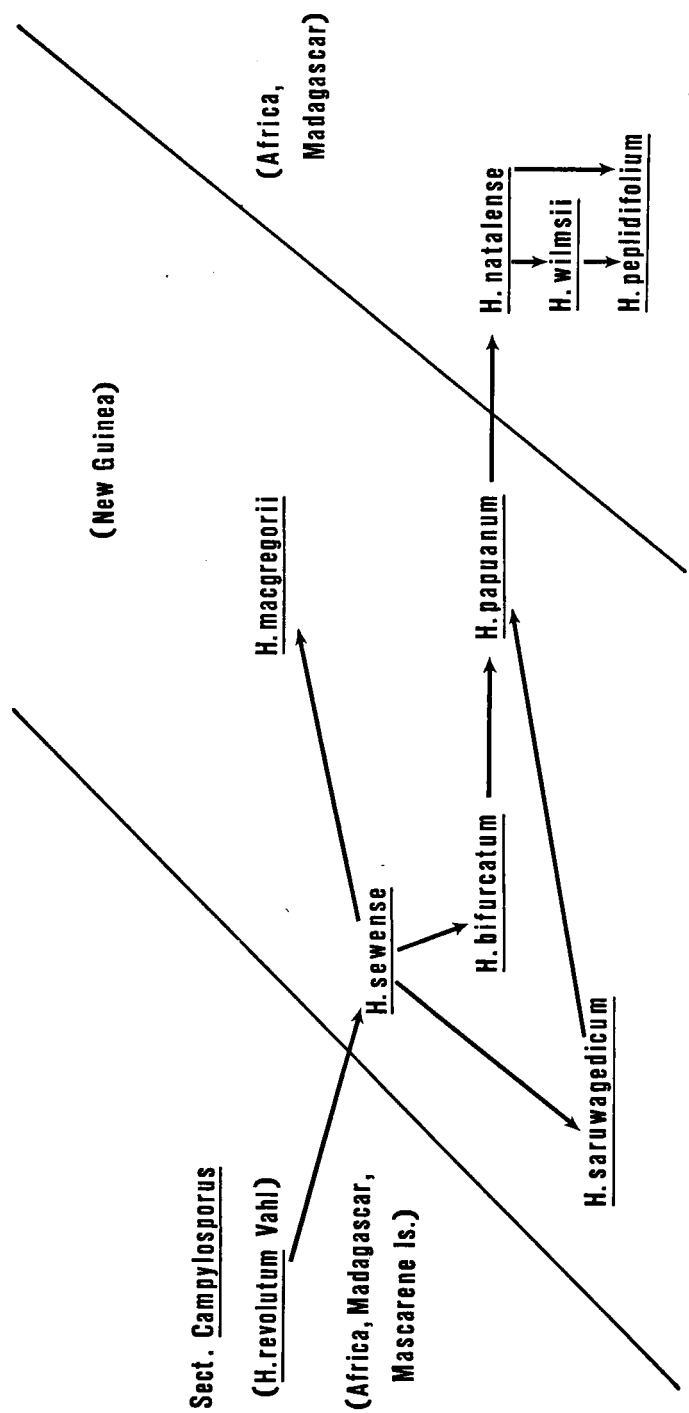

Figure 1. Affinities in sect. Humifusoideum

appeal for a solution to this problem to Continental Drift, suggesting that the two areas may have been connected through Australia and the members of sect. *Humifusoideum* subsequently exterminated there.

7. HYPERICUM SECT. PULOGENSIA N. ROBSON

When Kimura treated *Hypericum* in Nova Flora Japonica, he divided sect. *Homotaenium* (R. Keller) Y. Kimura into six series, of which only two occurred in the Flora area (Japan and Taiwan). These are series *Bilineata* and series *Elineata*, distinguished on whether the stem internodes bear two raised lines or not. In Series *Bilineata*, he recognised two groups of species, to each of which he gave the rank of 'grex'. Grex *H. attenuati* comprises four species from Japan, China, and eastern Siberia with erect herbaceous stems, broad thin leaves, and dichasial to monochasial cymes. In grex *H. nagasawai*, on the other hand, Kimura included six species endemic to Taiwan. It now appears that two species endemic to the *Flora Malesiana* area also belong to this group.

Kimura's sect. *Homotaenium* is an aggregation of unrelated species, all of which happen to have (or alleged to have) persistent petals and stamens, three stamen fascicles, three free styles, a trilocular ovary, and a capsule with uninterrupted raised vittae on the valves. His series, too, would appear to be mostly heterogeneous; but this point is uncertain as, apart from the species in Japan and Taiwan, he gives only the diagnosis and the type species of each. Within series *Bilineata* he recognised two greges. Grex *H. attenuati* has a wide Eurasian and North American distribution when all the related species are included and is probably best included with *H. perforatum* L. in sect. *Hypericum*, whereas grex *H. nagasawai* has hitherto consisted of six species endemic to Taiwan, but should include the following taxa from the Flora Malesiana area. Its species are herbs with diffuse, wiry, 2—4 or even 6-lined stems, stamens either in 3—5 fascicles or apparently afasciculate, and axile placentation. Its affinities are with sect. *Roscyna* (in particular *H. przewalskii* Maxim. and its allies, from western China) and possibly with some Japanese species of sect. *Hypericum*. From the former it differs in having three free styles and usually also in the disposition of the stamens and the presence of black glands, whilst the irregularity of the stamen arrangement and the absence of black glands on leaves and anthers (in *H. pulogense*) distinguish it from sect. *Hypericum*. From both sections it may nearly always be distinguished by the subfoliar indumentum of minute scales. These appear to be absent from some specimens of *H. nagasawai* Hayata, from Taiwan, and to be detectable in at least one specimen of *H. samaniense* Miyabe & Kimura (sect. *Hypericum*), from Japan, and so the distinction is not absolute. Nevertheless, Kimura's grex *H. nagasawai* appears to be sufficiently distinct to warrant its being raised to sectional rank as follows:

Hypericum sect. **Pulogensia** N. Robson, *sect. nov.* — *Hypericum* sect. *Euhypericum* Boiss. subsect. *Homotaenium sensu* Y. Kimura, Bot. Mag. Tokyo 54 (1940) 80 *pro parte quoad species caulis elevato-bilineatis* (3—8). — *Hypericum* sect. *Homotaenium* (R. Keller) Y. Kimura series *Bilineati* Y. Kimura grex *H. nagasawai* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 (1951) 137, 222.

Sect. *Roscynae* affinis sed staminibus obscure 3—5-fasciculatis vel afasciculatis, ovario triloculari, stylis liberis, differt. Ab sect. *Hyperico* indumento subsquamoso, interdum staminorum dispositioni, glandularum nigrarum absentia foliis antherisque, differt.

Herbae glabrae suffrutescentes rhizomatosae vel caulibus tenacibus diffusis perennibus instructae, ramis decumbentibus radicantibus. *Ramuli* 2—4 (6)-lineati vel anguste 2-alati, interdum teretescenti, eglandulares. *Folia* crassiuscula saepe ad margine recurvato-in-

crassata, infra plusminusve glauca, subsquamosa, glandulis laminaribus pallidis vel raro nigris saepe, prominentibus striiformis punctiformisque intermixtis vel punctiformis tantum, glandulis intramarginalibus aut pallidis aut nigris aut pallidis nigrisque intermixtis aut nullis. *Inflorescentia* 1-florata vel cymosa 3—5 (7)-florata vel raro paniculata circa 18-florata vel interdum ramulis floratis e flori proxime inferne axillis instructa. *Sepala* 5, glandulis laminaribus pallidis vel nigris vel pallidis nigrisque intermixtis, vel raro nullis glandulis submarginalibus vel marginalibus pallidis vel nigris, immersis vel sessilibus vel denticulis brevibus sparsis insidentibus. *Petala* 5, post anthesin persistentia, apiculo laterali parvo acuto vel nullo, glandulis laminaribus pallidis linearibus vel punctiformis vel raro nigris vel nigris pallidisque punctiformis intermixtis, glandulis marginalibus nullis vel plusminusve numerosis nigris immersis vel sessilibus vel subsessilibus vel ciliis brevibus insidentibus. *Staminorum fasciculi* 3—5 vel stamina ut videtur afasciculata, post anthesin persistentia, staminibus 15—80, petalis circa 1/8—1/3 breviora, connectivi glandula succinea vel nigra. *Ovarium* 3-loculare, loculis multiovalatis, stylis 3 ovario 1.2—2 plo longioribus stigmatibus punctiformibus vel vix capitatis. *Capsula* 3-locularis, valvis longitudine vittatis vel raro laevibus, ut videtur evittatis. *Semina* cylindrica, nec alata nec carinata, testa lineare reticulata vel linearo-scalari-formi.

Typus sectionis: *H. pulogense* Merrill.

As well as the six species endemic to Taiwan, viz. *H. nagasawai* Hayata, *H. randaiense* Hayata, *H. taiwanianum* Y. Kimura, *H. nokoense* Ohwi, *H. hayatae* Y. Kimura, and *H. suzukianum* Y. Kimura, sect. *Pulogensia* includes two species from the Flora Malesiana area, viz. *H. pulogense* Merrill (Luzon, Mts. Pulog and Tabayoc) and the following new species with two subspecies.

8. HYPERICUM BECCARII N. ROBSON

Hypericum beccarii N. Robson, *sp. nov.* (Sect. *Pulogensia*).

H. pulogensi Merrill affinis sed floribus minoribus, foliis petiolatis, connectivi glandula nigra, habitu debili diffuso, differt.

Herba perennis debilis, ramis c. 2—45 cm longis tenacibus decumbentibus vel adscendtibus vel (?) erectis radicantibus. *Ramuli* primo anguste 4—6-lineati, deinde 4-lineati vel raro 2-lineati vel subteretes. *Folia* petiolata, petiolo 0.2—1.5 mm longa; lamina 0.25—1.05 × 0.05—0.6 cm, late oblonga vel elliptico-oblonga vel anguste obovata vel linearia, apice rotundata vel subacuta apiculata vel mutica basi rotundata vel cuneata, subtus glauca subsquamosa, margine haud vel vix recurvata, patula, venis primis lateralibus, c. 3, plusminusve parallelis, reticulate ramosis, prope marginem apicemque conjunctis, venatione plusminusve dense valde reticulata; glandulae laminares pallidae, interdum plusminusve prominentes, inaequaliter punctiformes, glandulae intramarginales pallides vel nigrae vel pallides nigraeque intermixtae, irregulariter dispositae. *Inflorescentia* 1-florata terminalis, ex axillis supremis ramulis floratis instructa; pedicelli folia suprema plerumque superantes, in statu fructifero 2—17 mm longi. *Flores* c. 0.7—1 cm in diam., planae, in alabastro anguste ovoidea obtusae. *Sepala* 3.5—5 × 1—2 mm, libera plusminusve late imbricata, elliptico-oblonga vel oblongo-linearia, apice rotundata vel subacuta vel apiculata, margine integra vel irregulariter glandulo-ciliata vel glandulo-denticulata, glandulis laminaribus pallidis punctiformibus vel breve striiformibus, glandulis submarginalibus vel marginalibus nigris. *Petala* lutea, 3—7 × 2—2.5 mm, oblongo-oblanceolata, post anthesin persistentia, apiculo laterali parvo glandulari vel glandulo-ciliato, margine integra vel glandulis subsessilibus paucis instructa, glandulis laminaribus nullis vel prope apicem raro paucis nigris punctiformibus instructa, glandulis marginalibus nigris.

Stamina 3-fasciculata, circa 20—22, longa ad 4.5—5.5 mm, petalis circa 1/8—1/4 breviora, post anthesin persistentia; anthera lutea connectivi glandula nigra. *Ovarium* c. 1.5 mm longum, anguste ovoideum; styli 3, c. 1.5 mm longi, ovarium aequantes, sensim divergiates, stigmatibus paulo capitatis; placentae 3, axiles. *Capsula* 3—5.5 × 2—3.5 mm, plusminusve anguste ovoidea, longitudinaliter dense prominente vittata. *Semina* badia vel testacea, 0.7—0.9 mm longa, cylindrica, haud carinata, testa dense vadose lineari-reticulata.

subsp. **beccarii**

[*H. japonicum* var. *pinnatinervium* Bakh. *f.* in Backer & Bakh. v. d. Brink, Fl. Java 1 (1963) 382, *descr. angl.*].

Folia lamina 0.4—1 × 0.2—0.6 cm, late oblonga vel elliptico-oblonga vel anguste obovata, apice rotundato-apiculata vel mutica basi rotundata vel cuneata. Capsula longitudinaliter dense plusminusve vittata.

Typus: Sumatra: Sul M. Singalan in Sumatra occidentale nel 'Padangsche bovenlanden' (alto Padang), — 6/7 — 1878, *Beccari 337* (BM! holo, K!, L!, MEL!).

Note: Subsp. *beccarii* occurs at high altitudes in south and west Sumatra (Mt. Singalang, *Beccari 337*; Mt. Talamau, *Bünnemeijer 843, 967a*; Mt. Indrapura, *Matthew*; Mt. Kerintji, *Bünnemeijer 10398*; Tanang Talu, *Bünnemeijer 1050a*) and also, in a smaller form, in western Java (Mt. Papandajan, *v. Steenis 4080, Polak*).

subsp. **steenisii** N. Robson, *subsp. nov.*

Folia lamina 0.25—1.05 × 0.05—0.4 cm, oblanceolata vel linearia, apice rotundata vel subacuta plusminusve apiculata basi cuneata. Capsula longitudinaliter sparse obscure vittata.

Typus: Sumatra: Gaju & Alas Lands, Mt. Losir; bivouac 4 to 5, along stream on rocks in mossy forest, 2700—2800 m, 31—1—1937, *v. Steenis 8514* (A!, K!, L, holo!).

Note: Subsp. *steenisii* is known from only two mountains in northern Sumatra (Mt. Losir, *v. Steenis 8514, 8621*; Mt. Kemiri, *v. Steenis 9599*). Whereas the type collection has larger broader leaves and larger flowers and thereby approaches subsp. *beccarii*, the other two specimens are much smaller with narrower leaves and at first glance look very different from it. The virtual absence of vittae on the capsule, together with the leaf-shape differences, make it desirable to treat the north Sumatran representatives as a distinct subspecies.

9. HYPERICUM PETIOLULATUM HOOK. F. & THOMS.

Hypericum petiolulatum Hook. *f.* & Thoms. *ex* Dyer in Hook. *f.*, Fl. Brit. Ind. 1 (1874) 255. — Type: Sikkim, Lachen, 2700 m., 1—8—1849, *J. D. Hooker* (K!).

This species occurs eastwards from Nepal along the Himalaya in scattered localities in Sikkim, Bhutan, and north Burma, and has also been found in Sumatra (Mt. Kerintji) and Sabah (Mt. Kinabalu). Farther east, in Yunnan and Szechwan, most of the specimens tend to be larger and more luxuriant and to approach their nearest relatives in Sect. *Hypericum* (*H. seniawinii* Hand.-Mazz. and *H. faberi* R. Keller *ex* Hand.-Mazz.) in both morphology and distribution. These Chinese plants have been given specific rank more than once; but, since one Yunnan specimen (the type of *H. petiolulatum* var. *orbiculatum* Franchet) belongs to the western taxon and two others (*Pratt 409*, from near Tachienlu (Kangting), Sikang and *J. W. & J. Gregory s.n.*, from Yangpi pass (Yunnan)) are to some extent intermediate, it seems best to treat the two taxa as subspecies of *H. petiolulatum*.

With this circumscription, *H. petiolulatum* can be seen to be at the end of a south-

western extension of the Sino-Japanese centre of sect. *Hypericum*. It can be distinguished from *H. faberi* Hand.-Mazz. (also from Szechwan and Yunnan) by its broadly ovoid to orbicular (not ovoid) capsule, acute (not obtuse to apiculate or rounded) sepals with few or no (not a regular row of) submarginal black glands, and the markedly 'perforate' (not 'imperforate') leaves.

subsp. **petiolulatum**

Hypericum petiolulatum var. *orbiculatum* Franchet, Bull. Soc. Bot. France 33 (1886) 437; Pl. Delav. (1889) 103; Léveillé, Bull. Soc. Bot. France 54 (1908) 594. — Type: Yunnan, Mt. Koua-la-po, *Delavay 1942* (P!).

Hypericum thomsonii R. Keller, Bot. Jahrb. 33 (1904) 552 *pro parte quoad typum*. — Type: as for *H. petiolulatum* (*sphalm.* '*petiolatum*').

Hypericum mutilum sensu Ridley, J. Fed. Mal. Stat. Mus. 8 (1917) 17.

Hypericum petiolatum sensu R. Keller in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 21 (1925) 179 (*orth. mut. vice H. petiolulatum*).

Caulis plusminusve diffuse ramosus. Folia lamina in medio vel super mediam latissima, basi cuneata vel attenuata. Inflorescentia principalis praeter florem terminalem ex axillos supremo tantum evoluta. Styli ovario breviori.

Distribution: Nepal (Milka Bhanjzang, *Williams 1100*; near Tagat, *Stainton, Sykes & Williams 3374*; between Nanjang and Chitre, *Shrestha & Joshi*); Sikkim (Lachen, *Hooker*, no loc., *Gammie*); Bhutan (Tobrang, Trashi Yangsi Chu, *Ludlow, Sherriff & Hicks 20858*; Anganphorang, *Cooper 4839*); Burma (Nam Tamai Valley, *Kingdon Ward 13270, 13314*; China (Yunnan, Col de Koua-la-po (Hokin), *Delavay 1942*); Sumatra (Mt. Kerintji, *Robinson & Kloss 87*; *Bünnemeijer 9445*); Sabah (Mt. Kinabalu, Masilau R., *J. & M. S. Clemens 51370*).

subsp. **yunnanense** (Franchet) N. Robson, *stat. nov.* — *Hypericum yunnanense* Franchet, Bull. Soc. Bot. France 33 (1886) 437; Pl. Delav. (1889) 103, *pro parte quoad lectotypum*. Léveillé, Bull. Soc. Bot. France 54 (1908) 594. — Lectotype: Yunnan: Song-pin, supra Tapintze, *Delavay 1943* (P!).

Hypericum mairei Léveillé, Fedde Repert. 11 (1912) 298, *non H. mairei* Léveillé (1915); Lauener, Notes R.B.G. Edinb. 27 (1966) 4. — Type: Yunnan: Tong-Chouan, —6—1910, *Maire in Herb. Bonati 7492* (E!).

Hypericum centiflorum Léveillé, Bull. Geogr. Bot. 25 (1915) 23. — Types: Yunnan, plaine de Tong-Chouan et Tcha-Ho, —8—1912, *Maire* (E); plaine et vallons à Tcha-Ho, —7—1912, *Maire* (BM!, E lecto.).

Caulis erectus vel decumbens radicans ordinatiore ramosus. Folia lamina plerumque in medio vel infra mediam latissima, basi plerumque rotundata vel subcordata. Inflorescentia principalis praeter florem terminalem ex axillis superioribus 2—3 plerumque evoluta. Styli ovario longiori.

Distribution: Yunnan, Szechwan.

10. HYPERICUM SECT. BRATHYS (MUTIS EX L.F.) CHOISY

Hypericum sect. **Brathys** (Mutis *ex* L.*f.*) Choisy.

This section, of which the members range in habit from tall shrubs to dwarf annual herbs, is so distinct from most of the rest of *Hypericum* that it might merit subgeneric status, were it not for a few Central American species that approach closely to some African species of sect. *Campylosporus*. It is largely confined to the New World; but, apart

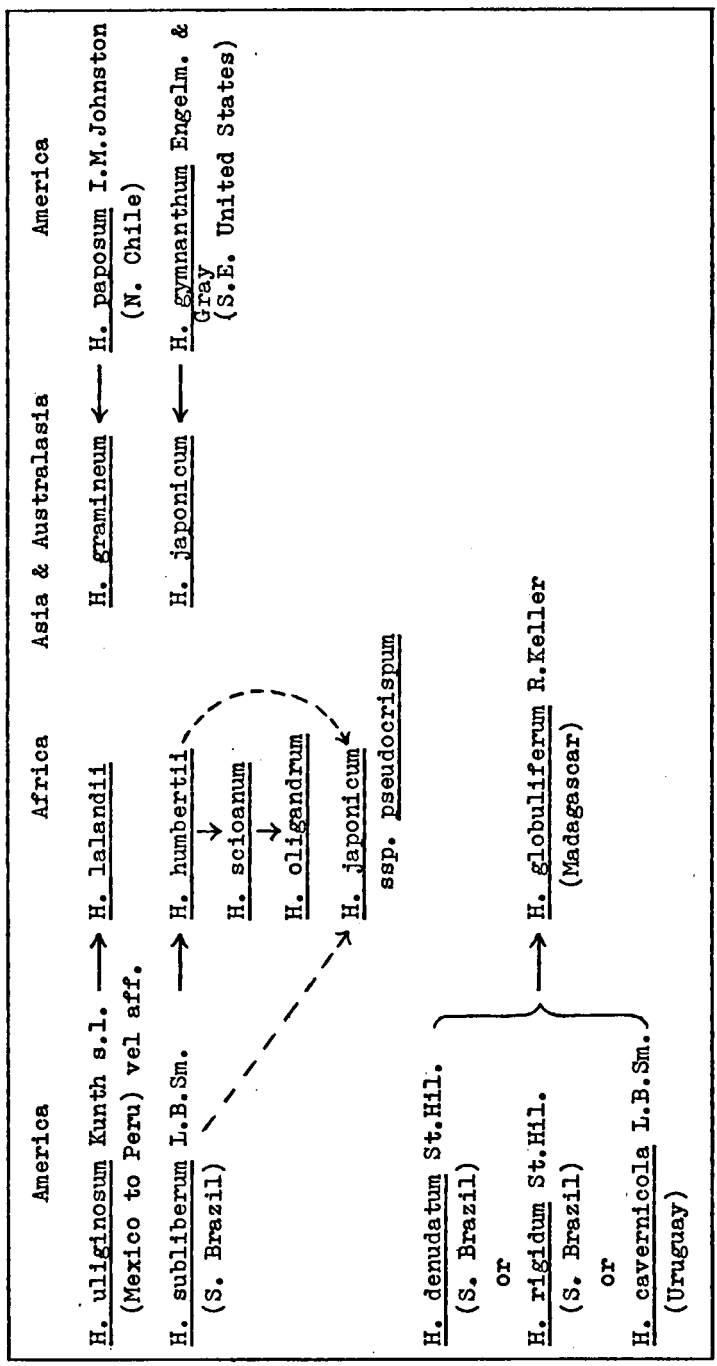

Fig. 2. Suggested interrelationships of Old and New World species of sect. *Brathys*.

TABLE 1 — Characters of Hypericum lalandii, H. gramineum and H. japonicum

	H. lalandii Choisy	H. gramineum G.Forster	H. japonicum Thunb. ex Murr.
Stems:	erect to decumbent, not rooting	erect to decumbent, not rooting	erect to prostrate, rooting at the base
Leaves:	elliptic-oblong to linear, apex acute to obtuse, base cuneate	ovate-lanceolate to linear, apex obtuse to rounded, base cordate to rounded	ovate to subcircular or obovate-spathulate, apex obtuse to rounded, base cordate to attenuate
Inflorescence:	dichasial to monochasial, without flowering branches	dichasial to monochasial, or mixed with flowering branches	dichasial to monochasial or sympodial, or mixed with flowering branches
Sepals:	lanceolate, acute	lanceolate to narrowly elliptic, acute to subacute	narrowly oblong to elliptic or obovate, acute to mucronate or rounded
Petals:	6—10 mm long, 1—2 x sepals	5—10 mm long, c. 1.3(—2?) x sepals	1.7—5 mm long, c. 0.9—1.3 x sepals
Stamens:	30—60	c. 30—50	5—30
Ovary:	ovoid-conic to ovoid	narrowly ovoid-conic	broadly ovoid to subglobose
Styles:	0.6—0.9 x ovary	0.5—0.9 x ovary	0.4—0.6 x ovary
Capsule:	narrowly ovoid to subglobose, acute to obtuse, 3.5—7 mm long, 0.8—2 x sepals	cylindric to narrowly ovoid, acute to obtuse, 2.5—8 mm long, c. 0.9—1.2 x sepals	obtuse to rounded, 2—6 mm long, c. 0.8—1.7 x sepals

from five North American species that appear to have reached Europe relatively recently (Heine in Bauhinia 2, 1962, 71—78; Robson in Fl. Europaea 2, 1968, 269), there are eight herbaceous Old World species, nearly all of which have their nearest relatives in America. These are:

a) Asia, Australasia.
   1) *H. gramineum* G. Forster (Australia, New Zealand, New Caledonia, New Guinea, Vietnam, Assam, Bhutan, Yunnan, Taiwan).
   2) *H. japonicum* Thunb. *ex* Murr. (Japan, Taiwan, Korea, China, westward along Himalaya to the Punjab; S. India and Ceylon; Burma, Thailand to Vietnam, Malesia, S.E. Australia, Tasmania, and New Zealand).

b) Africa.
   3) *H. lalandii* Choisy (tropical and S. Africa, Madagascar).
   4) *H. humbertii* Staner (E. Congo, Rwanda, Burundi, Uganda).
   5) *H. scioanum* Chiov. (Ethiopia to Malawi).
   6) *H. oligandrum* Milne-Redh. (Congo, Zambia).
   7) *H. japonicum* subsp. *pseudocrispum* (R. Keller) H. Perrier (Madagascar).
   8) *H. globuliferum* R. Keller (Madagascar).

H. japonicum subsp. *pseudocrispum* is not related to the Asiatic *H. japonicum*, but to the African species of the *H. humbertii* group (nos. 4—6 above). I hope to discuss its relationships in a future paper.

The suggested relationships of these Old World species (a) with each other and (b) with the American 'core' of sect. *Brathys* are indicated in Fig. 2.

From Figure 2 it is clear that the relationships of the African species are trans-Atlantic, whereas those of the Asian-Australasian species are trans-Pacific. The latter are across respectively the north Pacific (*H. japonicum*) and south Pacific (*H. gramineum*), as is shown more clearly when the morphological trends within each species is related to geography. Thus the most primitive forms of *H. gramineum* occur in New Zealand, Tasmania, and S.E. Australia, and trends are discernible from those northward and westward; whereas the most primitive forms of *H. japonicum* are found in Taiwan, China, and the Philippines. The question of how these links (respectively between (1) western S. America and S.E. Australasia and (2) Texas and eastern Asia) arose remains open; in these cases long-distance dispersal in the distant past cannot be ruled out, owing to the small seeds and predominantly wet habitats of *H. gramineum* and *H. japonicum*.

11. HYPERICUM GRAMINEUM G. FORSTER

Hypericum gramineum G. Forster, Fl. Ins. Austr. Prodr. (1786) 63. — *Brathys forsteri* Spach, Ann. Sci. Nat., sér. 2, Bot. 5 (1836) 367. — *Sarothra graminea* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 (1951) 246, t. 81. — Type: New Caledonia, *J. R. & G. Forster* (BM lecto!, K!).

Ascyrum involutum Labill., Nov. Holl. Pl. Spec. 2 (1806) 32, t. 174. — *Hypericum involutum* Choisy, Prodr. Monogr. Hypér. (1821) 50. — *Brathys billardieri* Spach, Ann. Sci. Nat., sér. 2, Bot. 5 (1836) 367. — Type: Tasmania, 'Habitat in capite Van Diemen', *Labillardière* (P).

Hypericum pedicellare Endl., Enum. Pl. Hueg. (1837) 12. — Type: W. Australia, Swan River, *Hügel* (W).

[*Hypericum aureum* Banks & Solander *ex* Hook. *f.*, Bot. Antarct. Voy. 2, Fl. Nova-Zel. 1 (1853) 36, *in synon.*, *non* Lour. (1790) *nec* Bartram (1791)].

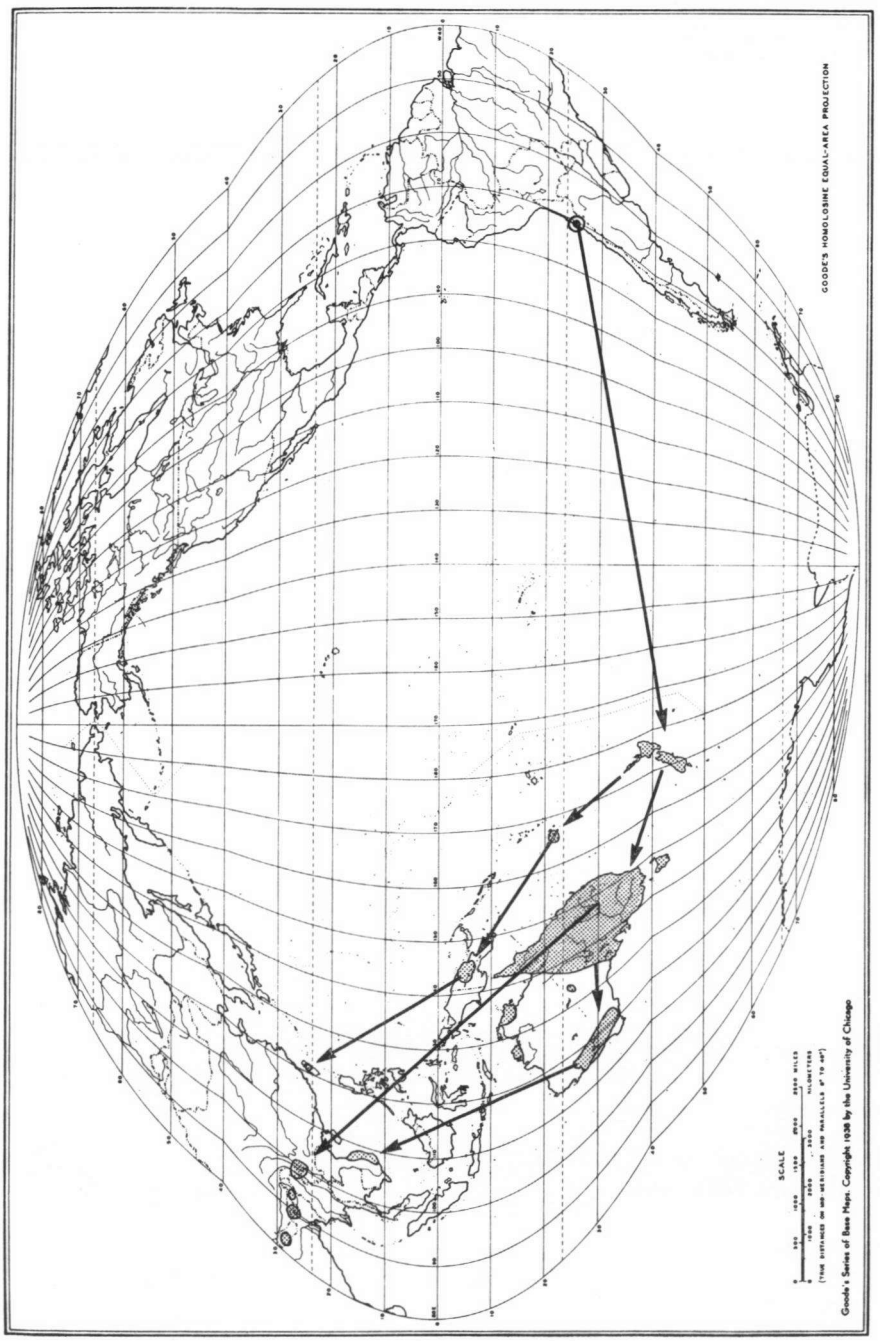

Fig. 3. Suggested migratory tracts of *H. graminicum*, based on trends in morphology. The point of origin indicated in northern Chile is the location of *H. paposum* I. M. Johnston.

Hypericum lalandii sensu Dyer in Hook. *f.*, Fl. Brit. Ind. 1 (1874) 256; Handel-Mazzetti, Symbol. Sin. 7 (1931) 404; *et auct. plur.*

[*Hypericum foetidum* Hook. *f.* & Thoms. *ex* Dyer in Hook. *f.*, Fl. Brit. Ind. 1 (1874) 257, *in synon.*].

Hypericum japonicum var. *australe* R. Keller, Bull. Herb. Boiss., sér. 2, 8 (1908) 186. — Types: Australia, Queensland, Trinity Bay, 1886, *Sayer* (BM!); Australia, Queensland (?), Plenty Ranges, *Walter* (Z! lecto).

Hypericum japonicum var. *lanceolatum* Y. Kimura, Bot. Mag. Tokyo 54 (1940) 88. — *Sarothra saginoides* Y. Kimura in Nakai & Honda, Nova Fl. Jap. 10 (1951) 246, t. 81. — Type: Taiwan, Prov. Hsinchu (Sintiku), Senkya-kuseki, *Simada 4116* (TI!).

H. gramineum has been confused frequently with *H. japonicum* and the African *H. lalandii* Choisy, but can be distinguished from both species, as shown in Table 1.

From this comparative table, it can be seen that *H. japonicum* differs from the other two species in having stems that root at the base and may be procumbent to prostrate, an inflorescence that may branch sympodially, usually more obtuse sepals, petals that are absolutely and usually also relatively shorter, fewer stamens, a broader ovary with relatively short styles, and a more obtuse capsule. In contrast with *H. lalandii*, *H. gramineum* has leaves broader below the middle and with a broader and more obtuse apex, an inflorescence that often has mixed branching, and a narrower ovary and capsule. *H. lalandii*, on the other hand, has leaves broader at the middle with a narrower base and more acute apex, an inflorescence that never has mixed branching, and a broader ovary and capsule.

When the Himalayan specimens that have hitherto been included in *H. lalandii* are examined with regard to these differential characters, it is clear that they belong to *H. gramineum* and not to Choisy's species, which therefore does not occur in Asia at all. On the other hand, although *H. gramineum* and *H. japonicum* are nearly always distinguishable, some Bhutanese specimens are intermediate in character. As the morphological trends within these species indicate that they have spread from two quite different regions, the intermediate specimens in Bhutan are almost certainly of hybrid origin, not the result of incomplete speciation.

Figure 3 shows the suggested migratory tracts of *H. gramineum*, based on morphological considerations. The three disjunct areas (Vietnam, eastern Himalaya, Taiwan) are likely to have been reached by long-distance dispersal from the southern centre of distribution, possibly by means of migratory birds, because (a) the distribution pattern does not appear to be reconcilable with any of the Continental Drift hypotheses (having regard to the distribution of *Hypericum* as a whole and the timing of drift movements that it implies) and (b) the morphology of the plants in each disjunct area links it with a different part of the main distribution area. Thus the Himalayan plants resemble some specimens from S.E. Australia, the Vietnam ones are like some specimens from Queensland and Western Australia, and the plants in Taiwan recall those in New Guinea and New Caledonia.

A mixed sheet in Herb. Kew (*Wight 128*) labelled 'Pulney Mountains' (Madras) contains both *H. japonicum* and *H. gramineum*. This is probably due to a mounting error, but if not, the area of *H. gramineum* should include Madras. Confirmatory specimens are necessary.

12. HYPERICUM JAPONICUM THUNB. EX MURR.

Hypericum japonicum Thunb. *ex* Murr., Syst. Veg., ed. 14 (July 1784) 702; Thunb., Fl. Jap. (Aug. 1784) 295, t. 31. — *Brathys japonica* Wight, Illustr. Ind. Bot. 1 (1838—40) 113; Blume, Mus. Bot. Lugd. Bat. 2 (1856) 19. — *Brathys japonica* var. *acutisepalum* Miquel, Fl. Ind. Bat. 1, 2 (1859) 514. — *Hypericum japonicum* var. *typicum* Hochr., Candollea 2

(1925) 436. — *Sarothra japonica* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 235, t. 78. — Type: Japan, 'In insula Nipon', *Thunberg* (BM!, UPS holo.).

Ascyrum humifusum Labill., Nov. Holl. Pl. Spec. 2 (1806) 33, t. 175. — *Hypericum pusillum* Choisy, Prodr. Monogr. Hypér. (1821) 50. — *Brathys humifusa* Spach, Ann. Sci. Nat., sér. 2, Bot. 5 (1836) 367. — *H. japonicum* var. *humifusum* Hook. *f.*, Bot. Antarct. Voy. 2, Fl. Nova-Zel. 1 (1853) 37; Hochr., Candollea 2 (1925) 437. — Type: Tasmania, 'Habitat in capite van Diemen', *Labillardière* (P).

Hypericum japonicum var. *ramosum* Choisy in DC., Prodr. Syst. Nat. 1 (1824) 549. — Type: Nepal, *Wallich* (G-DC, photo!).

[*Hypericum campestre* Moon, Cat. Ind. Exot. Pl. Ceylon (1824) 56, *nomen.*]

[*Hypericum dichotomum* Buch.-Ham. *ex* D. Don, Prodr. Fl. Nepal. (1825) 219, *in synon.*] — *Brathys nepalensis* Blume, Mus. Bot. Lugd. Bat. 2 (1856) 19. — *Brathys japonica* var. *mucronisepala* Miquel, Fl. Ind. Bat. 1, 2 (1859) 513. — Lectotype: Nepal, 'Hab. in Nepalia in scaturigenosis prope urbem Katmandu', *Buchanan-Hamilton* (BM!).

Tridia frankenioides Korth., Tijdschr. Nat. Gesch. Phys. 3 (1836) 17, t. 1. — Type: Sumatra, Padang, *Korthals* (L!).

Hypericum nervatum Hance in Walp., Ann. Bot. Syst. 2 (1851) 188. — Type: Hong Kong, *Hance* (unlocated).

Hypericum sumatranum Miquel, Pl. Jungh. (1855) 395. — Type: Sumatra, prope Padang, *Junghuhn* (L!).

Brathys japonica var. *accumbens* Blume, Mus. Bot. Lugd. Bat. 2 (1856) 19. — *Hypericum japonicum* forma *microphyllum* ('*microphylla*') Miquel, Ann. Mus. Bot. Lugd. Bat. 2 (1866) 289; Prol. Fl. Jap. (1866) 147. — *H. japonicum* var. *accumbens* Pamp., Nuov. Giorn. Bot. Ital, N.S. 17 (1910) 670. — *Sarothra japonica* forma *microphylla* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 240. — Type: Japan, *Siebold* (L!).

Brathys laxa Blume, Mus. Bot. Lugd. Bat. 2 (1856) 19. — *Hypericum japonicum* forma *tenuius* Miquel, Ann. Mus. Bot. Lugd. Bat. 2. (1866) 259; Prol. Fl. Jap. (1866) 147. — *Hypericum laxum* Koidz., Bot. Mag. Tokyo 40 (1926) 344. — *Sarothra laxa* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 241, t. 79. — Types: Japan, *Punt* (L!, lecto.); *Keithe* (L!).

Brathys debilis Blume, Mus. Bot. Lugd. Bat. 2 (1856) 20. — Type: Java, *Blume* (L!).

Brathys radicans Blume, Mus. Bot. Lugd. Bat. 2 (1856) 20. — Type: Sumatra, *Korthals* (L!).

Brathys cespitosa Blume, Mus. Bot. Lugd. Bat. 2 (1856) 20. — Type: Sumatra, *Waitz* (L!).

Brathys oryzetum Blume, Mus. Bot. Lugd. Bat. 2 (1856) 20. — Type: Celebes, in oryzetis circa Tondauo, *Forster* (BM! (?), L holo!).

[*Hypericum calyculatum* Jacquem. *ex* Dyer in Hook. *f.*, Fl. Brit. Ind. 1 (1874) 256, *in synon.*]

Hypericum thunbergii Franch. & Sav., Enum. Pl. Jap. 2 (1878) 300. — *H. japonicum* var. *thunbergii* R. Keller, Bull. Herb. Boiss., sér. 2, 8 (1908) 185. — Types: Japan, Nippon, circa Yokoska, *Savatier* 158 (K!, P, holo); Sagami, *Savatier* (P); in tractu Hakone, *Savatier* 3411 (P).

Hypericum mutilum sensu Maxim., Mél. Biol. 11 (1881) 171; Bull. Acad. Sci. St.-Petersb. 27 (1882) 436, *et auct. plur.*

Hypericum yabei Lév. & Vant., Bull. Soc. Bot. France 53 (1906) 498, 501, *non* Lév. & Vant. (1908). — *H. japonicum* forma *yabei* Makino, Syokubutu Dzukan. (1925) 553, t. 628. — Type: Japan, Nippon, in turfosis Kattasan, *Faurie 9* (BM!, E holo!).

Hypericum taquetii Lév. & Vant., Fedde Repert. 5 (1908) 279. — Type: Korea, Quelpaert I., *Faurie 1793* (BM!, E, holo).

Hypericum cavaleriei Léveillé, Bull. Soc. Bot. France 54 (1908) 593. — *H. japonicum* var. *cavaleriei* Koidz., Fl. Symb. Orient. As. (1930) 92. — Type: China, Kweichow, Kouy-tchéou, 1896, *Cavalérie* (E).

Hypericum dominii Léveillé, Bull. Soc. Bot. France 54 (1908) 593. — Type: Korea, Fusan, *Faurie 162* (E).

Hypericum japonicum var. *maximowiczii* R. Keller, Bull. Herb. Boiss., sér. 2, 8 (1908) 185. — Type: Japan, Nagasaki, 1863, *Maximowicz* (BM!).

Hypericum japonicum var. *calyculatum* R. Keller, Bull. Herb. Boiss., sér. 2, 8 (1908) 186. — Type: Sikkim, Teuta, *J. D. Hooker* (A!, G!, K!).

Hypericum japonicum var. *simplicius* R. Keller, Bull. Herb. Boiss., sér. 2, 8 (1908) 186. — Types: India, Assam, Naga Hills, *Prain* (unlocated); Tasmania, Hampshire Hills, 1837, *J. D. Hooker* (K!): Tasmania, Arthurs Lakes, 1837, *Gunn* (K!); Tasmania, *Hügel* (W).

Hypericum japonicum var. *plurinervium* Léveillé, Fedde Repert. 8 (1910) 451. — Type: Korea, Quelpaert I., Hannon, *Taquet 586* (BM!, E holo, K!).

[*Hypericum pseudo-japonicum* Nakai, Bot. Mag. Tokyo 27 (1913) 130, *nomen.*]

Hypericum japonicum var. *robustum* ('*robusta*') Miquel *ex* Koidz., Bot. Mag. Tokyo 40 (1926) 435. — *Sarothra japonica* forma *robusta* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 240, t. 79. — Type: Japan, *Siebold* (L!).

Hypericum japonicum var. *majus* ('*major*') Fyson, Fl. S. India Hill Stns 1 (1932) 49. — Type: India, Nilgiris (unlocated).

Hypericum laxum var. *hananoegoense* Masamune, Fl. & Geobot. Studies Ins. Yakusima (1934) 305. — *Sarothra laxa* f. *hananoegoensis* Y. Kimura in Nakai & Honda, Nov. Pl. Jap 10 (1951) 245. — Type: Japan, Yakusima I., Hananoego, 1926, *Masamune* (TI).

Hypericum laxum var. *novo-guineense* Hatusima, Bot. Mag. Tokyo 56 (1942) 571. — Types: West New Guinea, Arfak Mts., Angi, Lake Gita, *Kanehira & Hatusima 13563* (TI, A!); *13557a* (TI).

Hypericum japonicum var. *kainantense* Masamune, Trans. Nat. Hist. Soc. Formosa 33 (1943) 168. — Type: China, Hainan (Kainanto), Man-nei, 1940, *Masamune & Fukuyama 103* (TI).

Sarothra japonica forma *vulgaris* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 240. — Type: Japan, Honsyu, Prov. Iga, Simagahara-mura, 1935, *Kurokawa 34* (TI!).

Sarothra laxa forma *repens* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 244. — Type: Japan, Kyusyu, Prov. Tikugo, Yame-gun, Simohirokawa-mura, Mure, 1932, *Nakasima* (TI!).

Sarothra laxa forma *simplex* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 244. — Type: Japan, Honsyu, Prov. Iga, Zyonan-mura, 1934, *Kurokawa* (TI!).

Sarothra laxa forma *ramosa* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 244. — Type: Japan, Honsyu, Prov. Iga, Zyonan-mura, 1935, *Kurokawa* (TI!).

Sarothra laxa forma *erecta* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 245. — Type: Japan, Honsyu, Prov. Iga, Naga-gun, Kobe-mura, *Kurokawa* (TI!).

Sarothra laxa forma *ramosissima* Y. Kimura in Nakai & Honda, Nov. Fl. Jap. 10 (1951) 245. — Type: Japan, Honsyu, Prov. Musasi, Syakuzii, Sampozi-ike, 1919, *Hisauchi* (TI!).

The above synonymy, which is as complete as I can make it at present, covers the whole of the very variable *H. japonicum*; after repeated attempts, I have failed to find any valid subspecific taxa within it, far less any distinct species. The extensive variation can be classified into five main nodal variants (see below); but there are no gaps between them such as would enable any of them to be recognized taxonomically. On the other hand, the trends of variation within the species are clear, originating with plants which closely resemble the nearest relative of *H. japonicum*, *H. gymnanthum* Englem. & Gray of Texas

and adjacent areas to the east and north of the U.S.A. (table 2) and leading to those with a prostrate moss-like habit (Fig. 4).

TABLE 2. Characters distinguishing *H. japonicum* (Variant 1) from *H. gymnanthum*

	H. gymnanthum	*H. japonicum* (Variant 1)
Bracts	setaceous to linear-subulate	linear
Sepals	lanceolate to linear-lanceolate, acuminate to acute	oblong, subacute to obtuse
Capsule	narrowly ovoid, exceeding sepals	cylindric to subcylindric shorter than sepals

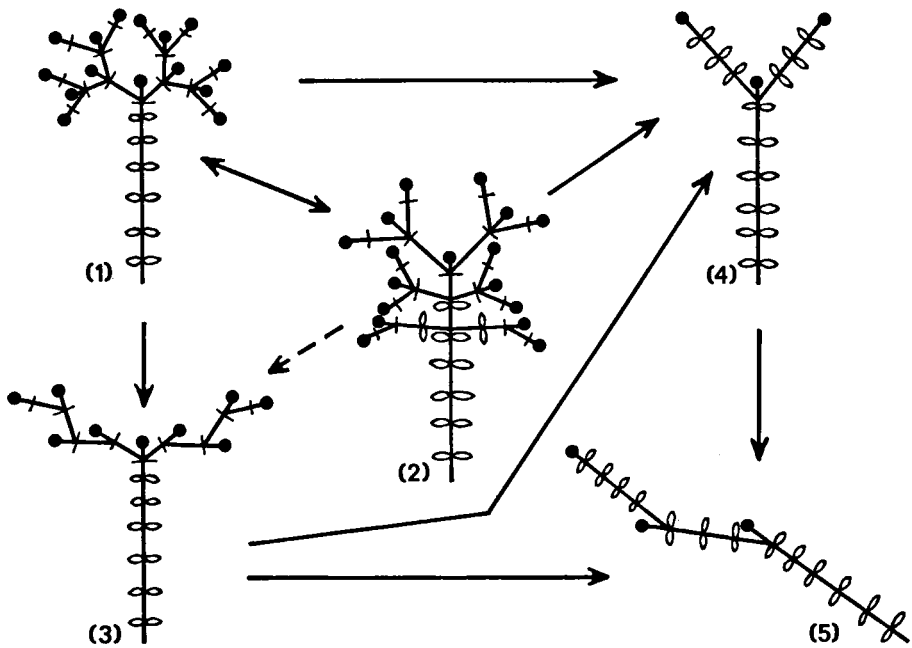

Fig. 4. The interrelationships of the nodal variants of *H. japonicum* as indicated by variations in the inflorescence: — (1) Dichasial cymes; (2) dichasial cymes with secondary inflorescences and branches; (3) monochasial cymes; (4) paired branches; (5) sympodial branches. Bracts in (1) are never foliar, in (2) and (3) not usually foliar, in (4) usually foliar, and in (5) always foliar.

Much has been made, especially by Japanese botanists, of an alleged difference between (a) erect, little-branched plants with small linear to lanceolate bracts (*H. japonicum*) and (b) decumbent to prostrate plants with foliose bracts (*H. laxum*). Although these can be recognised as nodal types, there appears to be no complete correlation between the bract and habit characters; indeed, the transitions from lanceolate to foliose bracts form a continuous series. Thunberg's original description gives 'Bracteae .. lanceolate, acuminatae, ..', whereas the plant in his figure has foliose bracts.

The five main nodal variants, which are illustrated in Fig. 4 and have their approximate distributions indicated in Fig. 5, may be distinguished by the following key:

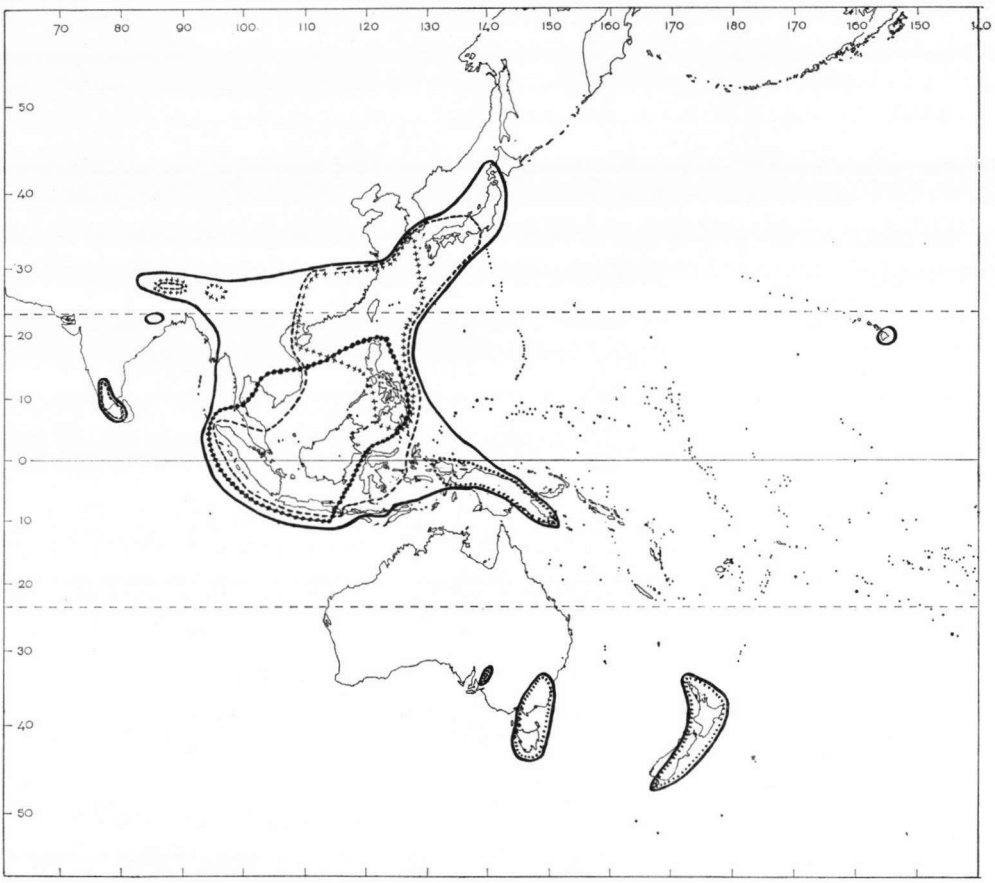

Fig. 5. Distribution of the nodal variants of *H. japonicum*: — (1) ++++; (2) ————; (3) -·-·-·-; (4) ----; (5) .....

KEY TO VARIANTS OF HYPERICUM JAPONICUM

1. Bracts (all or at least upper) linear to lanceolate, not foliar; stems erect to decumbent.
   2. Inflorescence at least partly dichasial; stems usually ± erect.
      3. Inflorescence from apical node only; stem without other branches . . . . . *Variant* (1)
      3. Inflorescence from other node(s) also; stem sometimes with other branches . . *Variant* (2)
   2. Inflorescence wholly monochasial or mixed with flowering branches; stems decumbent *Variant* (3)

1. Bracts all foliar; stems decumbent (or rarely erect) to prostrate:
   4. Stem-branching irregular or rarely absent, very rarely sympodial but then stems erect to decumbent (*Variant* (4)
      5. Sepals narrowly oblong to narrowly elliptic.
         6. Stems erect ('var. *maximowiczii*') . . . . . *Variant* (4a)
         6. Stems decumbent to procumbent (or prostrate?), diffuse ('var. *laxum*') . . *Variant* (4b)
      5. Sepals (at least outer) broadly elliptic to obovate.
         7. Stems decumbent or, if prostrate, then leaves ovate to narrowly oblong or oblong-elliptic; leaves 3—8 mm long, ovate or oblong to elliptic or rarely oblanceolate ('var. *calyculatum*') *Variant* (4c)

7. Stems prostrate; leaves 1—4 mm long, obovate to circular ('var. *tenuius*') . *Variant* (*4d*)
4. Stem-branching sympodial giving pseudo-axillary flowers or rarely absent; stem ± prostrate; sepals narrowly elliptic or narrowly oblong ('var. *humifusum*') . . . . . *Variant* (*5*)

Variant (1)

Stems erect, simple. Leaves ± broadly ovate, subacute to obtuse, cordate-amplexicaul. Inflorescence terminal only, regularly dichasial at first. Bracts linear. Sepals oblong, acute. Petals as long as sepals. Stamens numerous (25—30). Capsule cylindric or subcylindric, shorter than sepals.

Korea, China, Taiwan, Philippines.

Variant (2)

H. japonicum Thunb. *ex* Murr. *pro parte quoad typum et descr.* — *H. campestre* Moon, *nomen.* — *Tridia frankenioides* Korth. — *H. nervatum* Hance ? — *H. sumatranum* Miquel — *Brathys radicans* Blume — *B. cespitosa* Blume — *B. cespitosa* var. *pusilla* Blume — *H. taquetii* Lév. & Vant. — *H. japonicum* var. *plurinervium* Léveillé — *H. japonicum* var. *majus* Fyson ? — *Sarothra japonicum* forma *vulgaris* Y. Kimura.

Stems erect or more rarely decumbent, branched. Leaves ovate to narrowly elliptic, subacute to obtuse, cordate-amplexicaul to broadly cuneate. Inflorescence terminal and lateral, regularly dichasial at first. Bracts all or at least the upper ones linear to lanceolate. Sepals oblong to narrowly elliptic or oblanceolate. Petals as long as sepals. Stamens numerous (25—30). Capsule cylindric or cylindric-ellipsoid, shorter than sepals.

Distribution as for Variant (1), but also extends to S. Japan, India (Assam), Madras, Ceylon, Malaya, Sumatra, Java, Borneo, and Celebes.

Variant (2), which resembles Variant (1) but has lateral inflorescences and branches and is often somewhat decumbent, occurs in the same region and also as far as Ceylon and Celebes.

Variant (3)

Stems decumbent, rarely branched. Leaves ovate to oblong, obtuse, cordate-amplexicaul to rounded. Inflorescence terminal, wholly monochasial, or mixed with flowering branches. Bracts all or at least the upper ones linear to lanceolate. Sepals oblong to elliptic, acute to obtuse. Petals as long as sepals. Stamens *c.* 20. Capsule cylindric to cylindric-ellipsoid, shorter than sepals.

Thailand, Vietnam, Malaya, Sumatra, Java, Borneo, Philippines.

Variant (3), which resembles Variant (1) but has wholly monochasial branching from each uppermost axil, is a relatively rare development from Variants (1) and (2). It occurs almost wholly within the southern part of the area of Variant (2), only Thailand and Vietnam being outside the latter's area.

Variant (4)

Stems decumbent to prostrate (rarely erect), usually branched. Leaves ovate to narrowly oblong, rounded to cuneate. Inflorescence terminal and lateral, dichasial to monochasial or with flowering axillary branches or mixed. Bracts foliar. Sepal shape various. Petals as long as or shorter than sepals. Stamens relatively few ((5)10—20). Capsule subcylindric to globose, as long as or exceeding sepals.

Variant (4) occurs over the whole range of the species. Four subsidiary variants are discernible:

Variant (4a)

H. japonicum Thunb. *ex* Murr. *pro parte quoad tab. Thunb.* — *H. japonicum* var. *microphyllum* Miquel — *H. thunbergii* Franch. & Sav. — *H. yabei* Lév. & Vant. — *H. dominii* Léveillé. — *H. japonicum* var. *maximowiczii* R. Keller — *H. pseudo-japonicum* Nakai — *H. japonicum* var. *robustum* Miquel *ex* Koidz. — *H. laxum* var. *hananoegoense* Masamune — *Sarothra laxa* forma *simplex* Y. Kimura — *S. laxa* forma *erecta* Y. Kimura.

Stems erect. Leaves ovate to elliptic. Sepals narrowly oblong to narrowly elliptic.

Japan, Korea, China, Taiwan.

Variant (4b)

Brathys laxa Blume — *B. debilis* Blume — *B. oryzetum* Blume — *H. cavaleriei* Léveillé — *H. laxum* var. *novo-guineense* Hatusima — *Sarothra laxa* forma *repens* Y. Kimura — *S. laxa* forma *ramosa* Y. Kimura — *S. laxa* forma *ramosissima* Y. Kimura.

Stems decumbent to procumbent (or prostrate ?), diffuse. Leaves ovate to narrowly oblong. Sepals narrowly oblong to narrowly elliptic.

Throughout the range of the species.

Variant (4c)

H. japonicum var. *β ramosum* Choisy — *H. dichotomum* Buch.-Ham. *ex* D. Don — *Brathys nepalensis* Blume — *H. calyculatum* Jacquem. *ex* Dyer — *H. japonicum* var. *calyculatum* Jacquem. *ex* Dyer — *H. japonicum* var. *calyculatum* R. Keller.

Stems erect to decumbent or ± prostrate, sometimes diffuse. Leaves ovate or oblong to elliptic or rarely oblanceolate. Sepals (at least outer) broadly elliptic to obovate, often mucronate.

Himalayan region (Punjab, Kumaon, Nepal, Sikkim, Bhutan, Assam, Burma, China (Yunnan), N. Thailand, Vietnam), S. India (Madras).

Variant (4d)

H. japonicum var. *humifusum sensu* Hochr. in Candollea 2: 437 (1925). — *H. japonicum* var. *tenuis* ('*tenuior*') *sensu* Backer & Bakh. v. d. Brink Jr., Fl. Java 1 (1963) 382.

Stems prostrate. Leaves minute, obovate to circular. Sepals (at least outer) broadly elliptic to obovate.

W. Java (Tjibodas region).

Variant (4), in which the linear bracts of the earlier variants are replaced by foliar ones, appears to have developed independently in several parts of the range of the species. In lowland Japan and lowland China, the change from linear to foliar bracts preceded that from erect to procumbent habit, so that there are erect forms with foliar bracts (Variant 4a, 'var. *maximowiczii*') as well as the procumbent diffuse ones (Variant 4b, 'var. *laxum*'). In other regions, the reverse is the case or the changes took place simultaneously.

In the Indian area, the transition from Variants (1) and (2) to Variant (4b) occurs in lower regions of Assam and Burma and also in Madras and Ceylon; but a further stage occurs in the higher Himalayan regions, where all the Variant (4) plants have at least the outer sepals obovate or obovate-apiculate (Variant 4c, 'var. *calyculatum*'). There are some transitional forms in Assam and Bengal. Variant (4c) varies from more or less stout forms with decumbent stems to, on the one hand, prostrate diffuse forms and, on the other, simple 1- to few-flowered erect ones (var. *simplicius* R. Keller *pro parte*). These may all, or in part, be the result of hybridisation with *H. gramineum*.

In Java (Tjibodas area), Variant (4b) forms give rise to another form with the outer sepals obovate or broadly elliptic, apiculate or not and prostrate in habit with radiating

branches (Variant 4d, 'var. *tenuius*'). It differs from prostrate forms of Variant (4c) in leaf size and shape.

Variant (5)

Ascyrum humifusum Labill. — *H. japonicum* var. *simplicius* R. Keller *pro parte quoad lectotypus.*

Stems ± prostrate, diffuse or rarely unbranched. Leaves elliptic to narrowly oblong or oblanceolate, rounded. Inflorescence branching sympodial, so that flowers appear axillary. Bracts foliar. Sepals narrowly elliptic or narrowly oblong. Petals longer than sepals. Stamens few (5—10). Capsule subglobose, exceeding sepals.

New Guinea, Tasmania, New Zealand.

In New Guinea, Australia and New Zealand, the decumbent to procumbent forms of Variant (4b) give rise to a delicate diffuse ± prostrate form in which the branching is sympodial and the sepals usually narrow (Variant 5, 'var. *humifusum*'). In cases of extreme reduction, this form has simple, erect, 1—3-flowered stems (var. *simplicius* R. Keller *pro parte*).

Parallel to the variations indicated above, there are others in the number of stamens and in the relative length of the capsule. Variants (1) and (2) have 25—30 stamens (i.e. 5—6 × 5), whereas in Variants (4d) and (5) they may be reduced to 5 (i.e. 1 × 5). Likewise, Variants (1) and (2) have capsules cylindric or subcylindric, shorter than the sepals, whereas in extreme forms of Variants (4) and (5) they are subglobose and exceed the sepals.

The occurrence of *H. japonicum* in Hawaii is attested by a specimen in Herb. Kew (Hawaiian National Park, Napan Trail, 26—8—1942, *Fagerlind & Mitchell 14*). In form this resembles New Zealand plants and some from New Guinea, intermediate between Variants (4b) and (5), which suggests that this species has reached Hawaii by long-distance dispersal. The true *H. mutilum* L. also grows there, as a weed, which has been another cause of the confusion between these two species.

Two other *Hypericum* species have recently been recorded from Hawaii, viz. *H. gramineum* and *H. degeneri* Fosberg, Occ. Pap. B. P. Bishop Mus. 24 (1969) 21. It is not yet clear whether the latter is a form of *H. japonicum* or *H. mutilum*, or distinct from both these species.

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