

HYPERICUM CANADENSE L. IN WESTERN IRELAND

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DISCOVERY

The recent discovery of *Hypericum canadense* L. in the west of Ireland adds a new member of the 'North American element' to the flora of the British Isles. I have described elsewhere (Webb, 1957) the history of its discovery, and it can be very briefly summarised here.

In July, 1954, while looking for another plant on the west shore of Lough Mask, I saw a plant of what I took to be *Hypericum humifusum*, but with an unusual suberect habit. I took it into cultivation and kept it under observation for two years, but on account of over-dry conditions of culture it did not thrive and, beyond suspecting that it was not a normal specimen of a recognised British species, I could not identify it. I decided therefore to revisit the station in 1956, and on August 12th, in very wet weather which did not permit extensive observations, rediscovered the plant in some abundance and readily identified it as *H. canadense* on my return to Dublin next day. I visited the station once more in early September and made some observations on the plant's distribution and habitat.

Meanwhile I had learnt that Mr. D. McClintock had visited the station on August 14th, had found the plant, and had independently identified it as *H. canadense*. I had told him of the mysterious *Hypericum* and indicated the locality when he had passed through Dublin ten days earlier: at that time my plans were uncertain on account of illness, and we were therefore unable to co-ordinate our visits.

DESCRIPTION

The following description is compiled from Irish material. In a few minor particulars it differs slightly from the descriptions in American Floras; but it is clear in any case that the species is rather variable.

A slender, erect, entirely glabrous herb, more or less tinged with deep purplish red, especially in the lower parts, (3-) 12-20 cm. high, usually with the appearance of an annual and probably for the most part behaving as such, but capable in some circumstances of perennating by buds at ground level. Stem slender but stiff, sharply 4-angled and often slightly winged, usually unbranched except in the inflorescence, but in the strongest plants bearing a few short erecto-patent branches from the lower axils. Lower leaves elliptical or broadly oblong, 6-8 × 2.5-3 mm., patent; middle and upper ones narrow-oblong or linear-oblong, 12-20 × 2-4 mm., nearly erect; all plane, entire, obtuse, sessile and semi-amplexicaul, usually 3-veined and with numerous pellucid glands. Flowers up to 30 or more, but often only 3-9, in a regular dichotomous cyme; lowest bracts resembling the leaves, upper ones very small and narrow. Sepals 4 mm. long, ovate-lanceolate, obtuse or subacute, marked with pale or reddish streaks which represent lines of tissue similar to that which forms the pellucid dots on the leaves. Petals 3-4 × 1.5-2 mm., elliptical to narrowly obovate, deep golden yellow, usually with a crimson line on the back, rather widely separated, giving the flower a somewhat stellate form. Stamens 13-25,

rather obscurely grouped into five bundles. Ovary conical, with three short, spreading styles. Capsule deep red, ovoid-conical, 5-6 mm. long, somewhat exceeding the persistent calyx. Seeds straw-coloured, oblong, 0.5 mm. long.

In natural conditions the flowers open only in bright weather. In pot culture they remain closed even in bright light if the atmosphere is dry; they may be induced to open by covering the plant with a bell-glass.

The Irish plant appears to come rather closer to the variety *magninsulare* Weatherby (1928) than to the type. This variety, described from Grand Manan Island, New Brunswick, is distinguished by petals which are narrower and more pointed than in the type, and have a red line on the back. In the Irish plant the red line is present; the shape is intermediate between the two extremes figured by Weatherby.

STATION AND HABITAT

The main station, in which the plant is very abundant, as may be seen from Plate 11, is on a wet sandy flat in the townland of Gortmore, which lies on the west shore of Lough Mask near the south end, about half a mile north of the entrance of the Owenbrin River. The grid reference (on the provisional grid used for Ireland in the Distribution Maps Scheme) is 94/1336. The station is now in Co. Mayo, but as it was in Co. Galway till 1898 it should be regarded as falling in v.c. H.16 (W. Galway). Smaller colonies can be found near the main one for about half a mile in either direction; and one small outlier has been located over 6 miles to the north-east, at the north-west corner of the lough. This latter falls in v.c. H.27.

The distribution of the plant in its main station makes it clear that it is most at home in very wet conditions and that it requires a peaty, or at least a base-poor soil. Boggy flushes in the grassy vegetation of the sand-flat, pools in adjoining areas of shallow bog, the sides of drains cut in peaty soil, the edges of streamlets too small to cut for themselves a permanent, grass-free bed – these are the situations in which *Hypericum canadense* flourishes and is most abundant. The drainage comes from a hillside that is entirely composed of acid rocks, so that the general facies of most of the surrounding vegetation is calcifuge and peat is plentiful. The opposite shore of Lough Mask is, however, entirely limestone, and the water in the lake is consequently alkaline (pH about 8.0). In the lower part of the flood-zone, therefore, the vegetation is less calcifuge, and base-demanding plants like *Samolus valerandi* become frequent. But at this point *Hypericum canadense* stops short; I did not see it growing close to the lake-water, nor in immediate juxtaposition to *Samolus*.

The species most constantly associated with *Hypericum canadense* are *Hypericum elodes*, *Anagallis tenella*, *Juncus acutiflorus*, *J. kochii*, *Carex panicea*, *C. demissa*, *Molinia caerulea*, *Eleocharis multicaulis*, *Ranunculus flammula* and *Hydrocotyle vulgaris*.

GEOGRAPHICAL DISTRIBUTION

Hypericum canadense is found over a wide area of eastern North America, northwards to Newfoundland, southwards to Alabama, and westwards to Manitoba and Iowa. It has been recorded from two other stations in Europe: on the gravelly shores of peaty lakelets near Servance (Hte.-Saône) on the western flank of the Vosges (Bouchard, 1954), and on a heath near Almelo in eastern Holland (Jonker, 1935). In the former it was, curiously enough, discovered in the same year as I first noticed it in Ireland, but the Dutch station has been known since 1934.

HISTORY

Three hypotheses can be entertained with some degree of plausibility :—

1. The plant has recently been introduced to Ireland by human agency.
2. It has recently arrived in Ireland by natural means.
3. It is an old-established native.

1. This seems on the whole the least probable. Human operations in the neighbourhood of Gortmore are confined to small-scale farming and football. The district is wild and remote : five miles, in a direct line, from a village and fifteen miles from a port. The road carries little traffic, most of it local. The only American import ever likely to reach the district is maize or other grain, and this does not provide a likely medium for the transport of the seeds of a bog-plant. Indeed, it is difficult to cite an example of a bog-plant that is distributed by ordinary human operations of commerce or transport; and *Hypericum canadense* would scarcely be cultivated in a garden by even the most assiduous collector of novelties.

Bouchard believes that the only possible means of its arrival in France by human agency was by American troops in 1917-8, and does not regard this explanation as probable.

It should perhaps be mentioned here that *Hypericum majus*, a closely related American species, but sometimes favouring drier ground and more likely to behave as a ruderal, has recently been found on the Bohemian boundary of Bavaria (Merxmüller & Vollrath, 1956). *H. mutilum*, also native of America, is naturalised in northern Italy.

2. The only natural means of dispersal that suggests itself is transport on the feet of birds. No bird migrates regularly across the North Atlantic, but occasional stragglers of about a dozen American species find their way to Ireland now and then. The Greenland white-fronted goose, which has been rather freely invoked by botanists in recent years, breeds in west Greenland and winters either in North America or in Ireland. It cannot be seriously considered as a means of transport until *Hypericum canadense* has been recorded for west Greenland.

In general, this hypothesis, though it cannot be ruled out, seems rather a last resort and has no positive evidence for it.

3. The geographical range of *Hypericum canadense* agrees well enough with that of half a dozen other species which are generally (though not universally) believed to be relict in Europe for it to be reasonable enough to entertain the hypothesis that it is not a recent arrival in Ireland. There are, however, four questions to be answered before this interpretation can be accepted.

(i) Could the plant have withstood the last glaciation, and perhaps earlier glaciations as well, in western Ireland? We do not know enough to give a confident reply, but a plant that grows in central Newfoundland today cannot be exactly tender, and seems at least as likely to survive as *Najas flexilis*, which we know on fossil evidence has done so.

(ii) Is an annual (and *Hypericum canadense* may be regarded virtually as such) likely to persist in abundance as a relict in a restricted area? The *a priori* answer is No; if it can seed itself well enough to persist in abundance it should be able to spread if suitable habitats are near at hand. On the other hand *Helianthemum guttatum*, an annual which is clearly relict everywhere in the British Isles, has one mainland station (Three Castles Head, Co. Cork) where it grows in fair abundance in a very restricted area despite the close proximity of much similar terrain.

(iii) How do recent changes in the level of Lough Mask affect the issue? The cutting of the abortive Corrib-Mask canal about a century ago lowered the level of Lough

Mask, and if it could be shown that the ground on which *Hypericum canadense* now grows had been under water till then, this would tell strongly against the relict hypothesis. An examination of the 1841 Ordnance map shows, however, that this is not so. The strip of ground exposed varies in width, in this part of the shore, from 80 to 300 yards, and, save for a few tongues which follow the course of streams, *Hypericum canadense* stops short of the lake-shore by just about this distance.

The issue is complicated by the fact that there is an obvious earlier shore-line higher up (referred to by Praeger in *The Botanist in Ireland*), and the *Hypericum* grows mainly, though not entirely, below the level of this. As to its age, however, we have no clue; granted that it must be post-glacial, it may well be old enough for the plant to have been able to adjust itself at its leisure to the change in water-level by migrating downwards for a hundred yards or so.

(iv) Why had it not been seen before, and is its simultaneous discovery in Ireland and France simply a coincidence? Here is the real crux. The plant is so abundant and (thanks to its dark red foliage) conspicuous that I still find it impossible to understand how I noticed only a few plants in 1954, and how Praeger failed to notice it twenty years earlier when he visited the spot. The earlier visits were at the beginning of July, when the plant is presumably much less conspicuous, but this argument alone does not convince. Bouchard also poses the first part of the question, for his French station is close to a lake well worked by local botanists. He points out, however, that *Littorella uniflora*, an abundant and constant associate of *Hypericum canadense*, had not hitherto been recorded from the department of Haute-Saône. It is clear that the botanists had followed a well-worn trail with their noses to the ground. This was seldom Praeger's practice, but even as keen-eyed a botanist as he can fail to see one plant when he is looking for another, and on this visit he was looking for *Lycopodium inundatum*. It is perhaps revealing that he did not record the presence of *Pilularia*, a very rare plant in Ireland, which here grows in some abundance, very close to the *Hypericum*. In Holland, although the plant was not recognised till 1934, it was collected as long ago as 1909 (specimen in herbarium of Royal Netherlands Botanical Society) and it is remarkable that here, too, it grows accompanied by a rare plant (*Wahlenbergia hederacea*: only station in Holland) which was discovered here only a year before the *Hypericum*. In all cases, therefore, there is evidence that the locality had not been well searched by botanists.

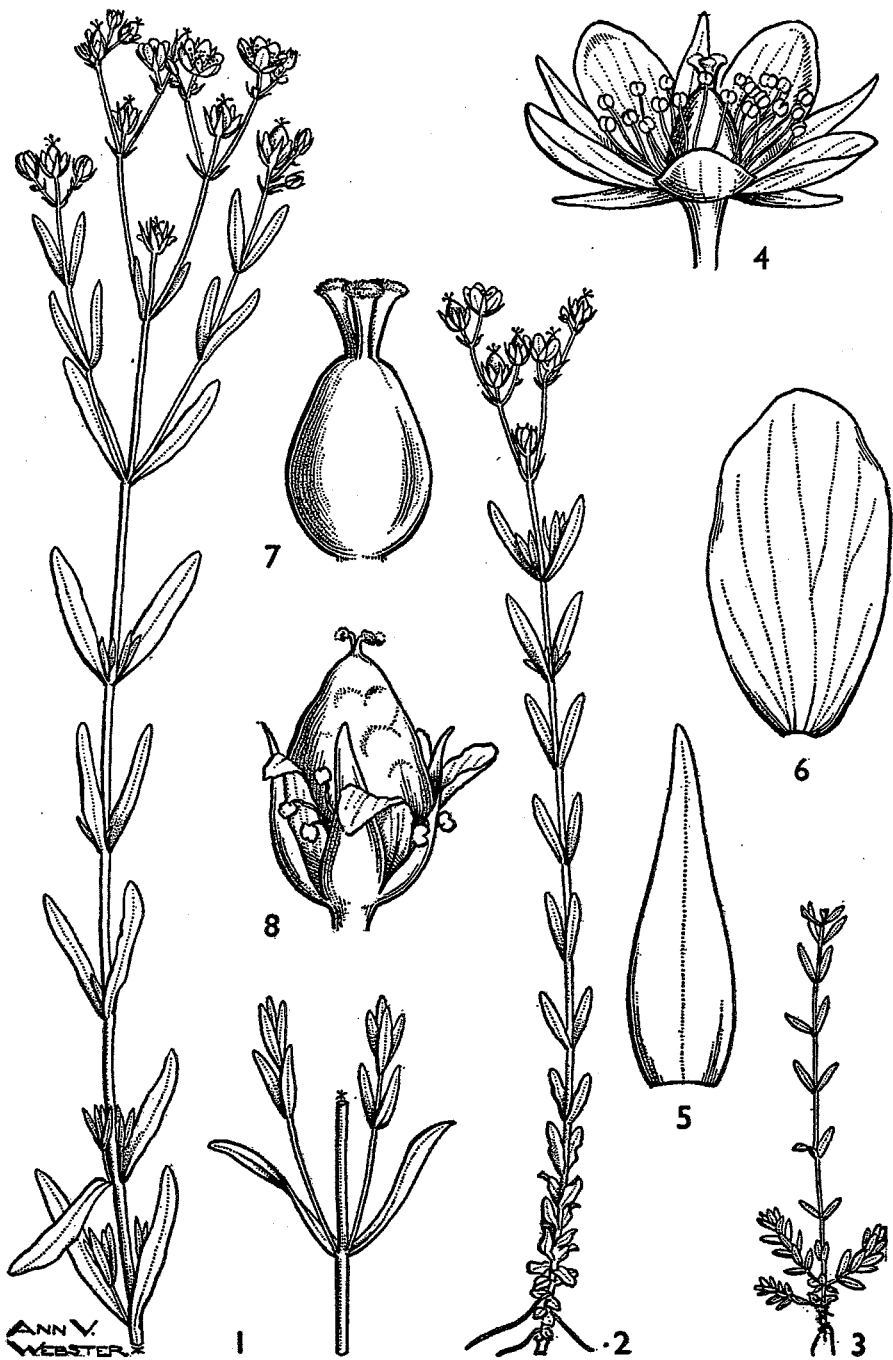
It will be seen that in my opinion the balance of evidence is in favour of supposing that *Hypericum canadense* is relict in Ireland and on the Continent. The coincidence of its simultaneous discovery in Ireland and France is remarkable, but it may be recalled that *Erica mackaiana* was discovered in the same year in Ireland and in Spain. And what possible chain of circumstances could have led to the transport of seeds from America to Lough Mask, to a Dutch heath and to the Vosges, without having scattered them broadcast all over Western Europe?

The answer should however, be provided by the next few years. If the plant spreads rapidly, then it is almost certainly a recent introduction by one means or other, if it shows no sign of spreading, it is only reasonable to accept it as an old-established native.

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Hypericum canadense L. from Gortmore. 1. Large plant. 2. Average-sized plant. 3. Plant after six weeks' greenhouse culture, showing perennating shoots at ground level. 4. Flower. 5. Sepal. 6. Petal. 7. Gynaecium. 8. Nearly mature capsule. 1-3, natural size; 4 and 8, $\times 6$; 5-7, $\times 12$.

PLATE 11.



Hypericum canadense L. at Gortmore, Lough Mask, Co. Mayo, forming a conspicuous dark fringe to the streamlet which runs through the sandy flat. In the middle distance is the former shore-line with miniature dunes; beyond this the road, and beyond it, to the right, part of a drumlin.