

Part 2

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During the course of an extensive series of cultivation – and breeding – experiments on the species and races of *Armeria* which I have carried out in the experimental gardens of the University of Leeds and the Carnegie Institution of Washington (at Stanford, California), material of coastal and montane forms of *A. maritima* as well as the grassland thrift here called subsp. *elongata* has been studied. These studies, which have enabled certain biosystematic conclusions to be drawn as well as making more certain the identification of plants from nature, will be published elsewhere.

The South Lincolnshire populations described here were visited by me whilst on leave from the Gold Coast, on August 10th, 1956, under the guidance of Miss Gibbons. Leaf- and scape-samples were collected and some ecological observations were made. The latter were in close accord with those reported by Miss Gibbons and Mr. Lousley. This visit enabled me to confirm my previous provisional determination of the plants as *A. maritima* “var. *elongata*,” for they agree in key characters with those in culture from Scandinavian and Polish sources. In particular, they have long, glabrous scapes bearing rather flat heads of pale flowers. The outermost bracts of the heads are rather long and pointed while the involucre sheath is also long (up to 2.5 cm.). The pilosity of the calyces is pleurotrichous. The leaves have a single prominent nerve and are deeply channelled on the upper surface; in a majority of plants they are ciliate on their margins.

The treatment of these grassland thrifts suggested by Miss Gibbons and Mr. Lousley as a subspecies of *Armeria maritima* distinct from the coastal and montane forms is in agreement with the results obtained from the experimental production and breeding of hybrids in Leeds and follows the treatment given to other ecological races in this species by me (Baker, 1953). Such hybrids between subsp. *elongata* on the one hand and British coastal material on the other have proved fully fertile in the first and second generations (Baker, 1954a, and unpub.). The chromosome-number of subsp. *elongata* has been determined both from the Continental cultures and from Ancaster and shows $2n = 14$, the same as for the other subspecies of *A. maritima*.

The South Lincolnshire populations, like material of subsp. *elongata* from all sources, show the pollen- and stigma-dimorphism (Baker, 1948a, b, 1954 a, b) characteristic of the Old World, non-arctic species of the genus. Dimorphism of this type in a population is an indication that cross-pollination is the general rule and that isolated plants are unlikely to produce viable seed.

It was clear from the burial-ground population in August, 1956, that the thrift was very much more abundant on relatively new graves where there was little shading and root-competition by grasses than it was in places where the grasses had become rank. This is in agreement with observations made in the garden at Leeds where this taxon, like the other subspecies of *Armeria maritima*, has shown itself very unfavourably affected by artificial shading which, in particular, reduces flowering considerably. The length of the leaves of the Ancaster plants could be related directly to the rankness of the grass around them (cf. Table I).

A similar picture was provided in the pasture (Habitat No. 1). Here the thrift was particularly frequent on the ant-hills. Although both the grasses and the leaves and scapes

TABLE 1.

	Mean leaf length (cms)	Standard error	Mean leaf breadth (cms)	Standard error	Mean Leaf Index (length/ breadth)	Standard error
Ancaster: pasture heavily grazed by cattle. Habitat No. 1	6.0	± 1.4	0.11	± 0.03	61.3	± 23.3
Ancaster: portion of Burial Ground unoccupied by graves (scythed occasionally). Habitat No. 3	7.1	± 1.8	0.11	± 0.03	67.3	± 20.9
Ancaster: sandpit; in long grass Habitat No. 6 (one plant)	20.4	—	0.10	—	204	—

of the thrift were freely grazed by cows and the flowering of the latter was seriously reduced thereby, its very existence must have been favoured by the complete removal of shading. This sensitivity to grass-competition must be kept in mind when considering the history of subsp. *elongata* in Britain.

The sub-fossil record of *Armeria* in the British Isles is a relatively complete one, including Inter-glacial, Full-glacial and particularly Late-glacial finds. Unquestionably, *Armeria maritima* was widespread over the country at all elevations during Late-glacial time when a relatively open, unwooded vegetation prevailed (Baker, 1948 *b*, 1956; Godwin 1956). With the subsequent increase of grass-competition and the development of forests, the thrifts were eliminated except from the mountains and at the coasts where shading from trees and tall grasses did not apply. A similar history may be cited for *Plantago maritima* and *Silene maritima*, the frequent associates of the thrifts on sea-coast and mountain.

A comparable picture has emerged from studies of sub-fossil deposits from the continent of Europe (cf. Iversen, 1940; Szafer, 1945; Jessen, 1949). Nevertheless, there is no reason to believe that the hardy thrifts which kept so close to the ice included subsp. *elongata*; indeed, in cultivation at Leeds, this subspecies has revealed itself rather susceptible to harm from frosts. Its more or less continuous, unicentric distribution in north-central Europe, covering much once-glaciated land, suggests that its range has largely been achieved post-glacially even if its origin is older. Iversen (1940) concluded that *elongata* is a very young race deriving either from coastal or alpine (var. *alpina* Lawr.) material. However, the extent of its distribution shows that its history is not a short one even though it may be a *relatively* young subspecies.

None of the 34 stations for fossil and sub-fossil *Armeria* in the British Isles listed by Godwin (1956) seems particularly likely to have harboured subsp. *elongata*, for those of less than Late-glacial age are all montane or coastal. Consequently, we are left with only the historical record dating from the early eighteenth century and a suspicion that the subspecies was never widespread in Britain. On the other hand, there is no more reason than with the Breckland "Continental" species (which have much in common with subsp. *elongata*) to suppose that the establishment of the subspecies in Britain was not entirely natural (cf. Pigott and Walters, 1954, p.102).

This is not to deny the importance of man's influence upon the present abundance of the subspecies. Clearly it is favoured by grass-cutting in the Ancaster burial-ground (and, presumably, in any hay-field) and by the grazing of domestic animals in the pastures,

while the forest-clearing which began in eastern England in the Neolithic Age may even have prevented its extermination long ago. One wonders how it may have fared before man became a farmer but suspects that it reached its heyday in a bygone predominantly pastoral period. At present the increasing disturbance of the ground by ploughing and building is undoubtedly reducing its numbers considerably.

It is possible that there is evidence of a less direct nature suggesting the aboriginal status of subsp. *elongata* in eastern England. Amongst other features, this subspecies is characterised by ciliate margins to its leaves, a feature which has not varied in cultures from four Scandinavian and Polish sources. Nevertheless, the analysis of leaf-samples from Ancaster No. 1 and No. 3 populations showed 48% and 28% of glabrous leaves, respectively. The glabrous leaves showed no significant differences in length or breadth from those with ciliate margins but both samples were uniformly slightly narrower and less obviously flattened than is usual in the subspecies (1–1.5 mm. against up to 3 mm.). Narrow, glabrous leaves are particularly characteristic of salt-marsh forms of *Armeria maritima* and are also found in a considerable proportion of the rock and shingle populations.

In British coastal and montane populations of *Armeria maritima* the scape is characteristically hairy (unlike the glabrous condition in subsp. *elongata*). Glabrous scapes have not been noticed in large numbers of herbarium specimens which have been seen, nor have they appeared in cultures derived from British sources with the exception of Blakeney Point and Scolt Head Island (Norfolk) where the proportion of plants with glabrous scapes may rise as high as 40% in some samples. No cultures have been raised from seed collected on the Lincolnshire coast, but this should be tackled by someone residing conveniently near who might also pay attention to the shape of the outermost bracts of the plants (for they are short and blunt in typical coastal plants but long and pointed in subsp. *elongata*). Subsp. *elongata* bears paler flowers and begins to produce them later in the season than is usual in chasmophytic plants from the coast but any observations upon these features will be complicated by the great variability of the latter and by the similarity of salt-marsh plants to subsp. *elongata* in these characters.

Too much must not be made of these aberrant characters in eastern English populations for, in both cases described here, the peculiarities could have had their origins in mutations within the races concerned and owe nothing to mutual introgression. Nevertheless, if the area occupied by *elongata* were sufficiently larger in the past, the races could well have come into contact and hybridised, for we know that they are interfertile and outbreeding. The only other detailed reports of such a re-assortment of characters between *elongata* and the coastal forms (Turesson, 1922) have referred to populations of unquestionably mixed ancestry on the southern Swedish coasts. Such taxonomic treatments as those of Christiansen (1931, 1932) show that it is in regions where the ranges of the forms overlap, particularly around the Baltic coastline, that intermediate plants of all sorts may be found (which he called var. *intermedia* and credited with four forms and sub-forms). Focke (1903) had earlier grouped the hybrid populations from the German Baltic coast as *Armeria ambifaria*.

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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,