

## Progress in British *Rubus* studies

A. NEWTON

11 Kensington Gardens, Hale, Altrincham, Cheshire

### ABSTRACT

The attempt to group together *Rubus* microspecies in *species collectivae* as practised by Focke and Sudre is contrasted with the modern tendency to abandon such categories. The aims and progress in the study of *Rubus* taxonomy in Britain are outlined, with special reference to the formation of a *Rubus* data bank and to the importance of distributional criteria in a full understanding of the genus.

The history of *Rubus* studies can be thought of as a 'tug-of-war' between diametrically opposed schools of thought—on the one hand recognition of increasing numbers of microspecies, on the other an attempt to group together members of morphologically similar entities as *species collectivae*.

Incidentally, it solves no problems to ascribe varietal or subspecific rank to taxa. All must be treated of equal status; this is because the vast majority of taxa reproduce apomictically and are thus constant, but occasionally reproduce sexually, giving rise to hybrids and new apomicts.

The major monographers (Focke 1914, Sudre 1908-13) have concluded that, in order to reduce the numbers-problem to assimilable terms, European *Rubi* should be grouped under about a hundred headings (*formenkreis*, circle species) under which can be allocated the multifarious legions of brambles which have been described by European authors since 1827, the completion date of Weihe & Nees' *Rubi Germanici*. The criteria used are combinations of characters compounded from growth-habit; stem armature and glandulosity; terminal leaflet shape, toothing and clothing; flowering branch structure and armature; and floral particulars.

The sectional treatment, with descriptions, given by Warburg (1962) provides a useful outline account of the taxonomic framework currently in use.

In most cases the monographers have chosen as *hauptform* or 'senior species' the name of a widespread and easily recognised taxon (e.g. *R. radula* Weihe ex Boenn., *R. gratus* Focke) but in other instances (e.g. *R. hirtus* Waldst. & Kit., *R. serpens* Weihe) they adopted ancient basic names which are used *sensu lato* (since the original author's specimens could not and cannot be located) to represent large numbers of widespread taxa with very similar characters, but each anomalous in small details. Two major sources of confusion arise from this treatment.

i) In some instances an early (often basically descriptive) name, e.g. *R. hirtus*, has been chosen as the *hauptform* of a *formenkreis* which embraces many closely similar taxa. Unfortunately, the use of the binomial *sensu stricto* may apply only to a very locally distributed taxon, and other much more wide-ranging (and therefore significant) species may be subordinated to it. This has led to considerable confusion among later interpreters who have been led into the trap of assuming a widespread distribution for a local species.

ii) It is impossible to draw the boundaries of each *formenkreis* so tightly as to be able to assign any bramble encountered unequivocally to any one *hauptform*—many taxa will fit equally uncomfortably into more than one compartment; inevitably these categories overlap and the compartments themselves are imprecise.

It is clear that the synoptic tendencies of batologists have varied with increasing age and experience. In their younger, energetic years they may have been disposed to think analytically in terms of large numbers of equally valid taxa—but in old age, patience tends to become exhausted, or perhaps it is tempting to resolve problems by adopting larger groupings in an attempt to smooth out the differences and with them the difficulties. Inevitably, also, dealing with such a widespread and polymorphous

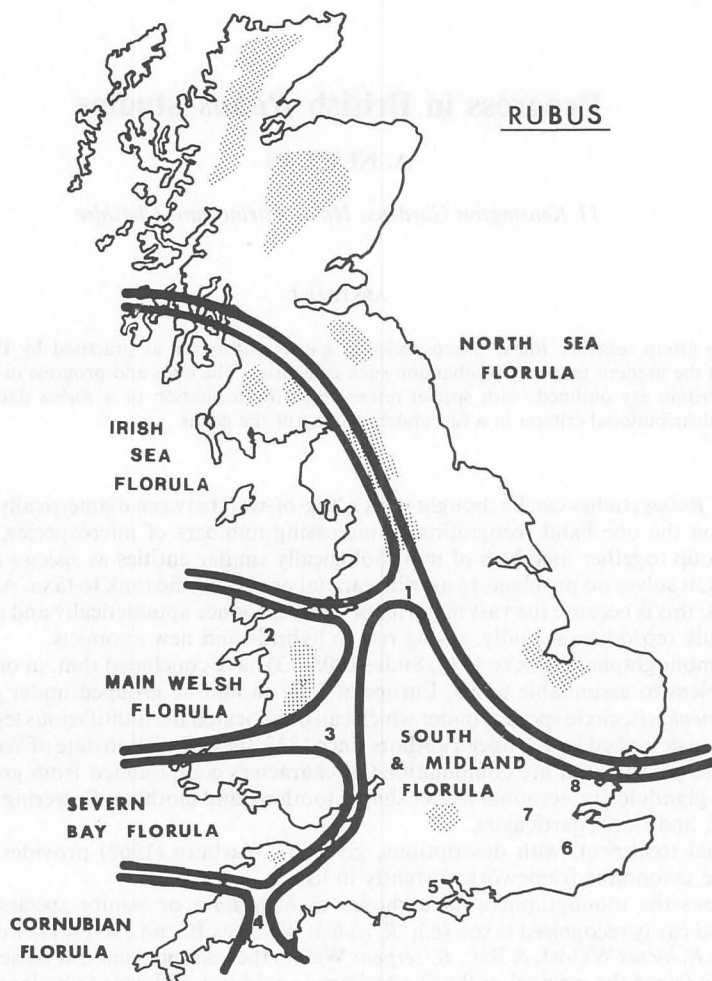


FIGURE 1. Distribution of *Rubus* florulas and regional endemic complexes in Great Britain. Main florulas identified by legend, regional complexes by number:

- |                |                  |
|----------------|------------------|
| 1. Sub-pennine | 5. New Forest    |
| 2. Padarn      | 6. Ashdown       |
| 3. Archenfield | 7. Thames Valley |
| 4. South Devon | 8. North Essex   |

Shaded areas denote high, wet or chalky ground with few or no brambles.

group as *Rubus* has imposed on the monographer strict limitations, bias and even distortion. He cannot possibly see all the brambles growing in the field; and reliance on herbarium specimens may lead as it did in both Focke's and Sudre's cases (particularly the latter) to misconceptions and mistakes. These were due in large part to unfamiliarity with the range of variation exhibited by a particular species, from soft, flaccid, large-leaved, small-panicked representatives grown in shaded, humus-rich localities ('*formae umbrosae*') to over-prickly, crisp-leaved, often dwarfed individuals from dry, sandy banks ('*formae apricae*'). A batologist relying solely on herbarium sheets of unfamiliar taxa will make many errors, and collectors have tended in many cases to be somewhat indiscriminating when gathering specimens. Many still are! 'Life is short and brambles are interminable', said Lord de Tabley (1899),

and E. S. Edees has added (*in litt.*) that many of them are indeterminable also (*pace* Watson). I agree with both sentiments.

What strategy, therefore, is the earnest student to adopt? First, he has to understand what everyone else has said on the subject. He has to evaluate and check previous authors' efforts. He has to study vast numbers of herbarium specimens to see if commentators' views can be sustained and are consistent. He has to avoid being browbeaten by august authority and not be afraid to challenge accepted views, but also honest enough to accept a contrary view as correct if the facts support it. He has to work from his own field and herbarium knowledge (separate skills, these) outwards, getting to know the plants fresh and dried, verifying all his conclusions and testing his hypotheses on other pundits. And gradually, painstakingly, a commonly accepted hardcore of evidence can be assembled.

It will be obvious that no statement about the distribution of *Rubus* species and hence about their endemism or otherwise can be made unless the identity of taxa can be unequivocally established. For this it is essential for original syntype material to be located and inspected, the original diagnosis carefully examined with the specimens, and lectotypes chosen where holotypes are not cited. There are many problems to be wrestled with in these areas, but it is comforting to know that all contemporary batologists accept a compatible strategy. The concept of circle species, with its imprecision and obfuscation of crucial distinction, has been abandoned. Much careful work has been undertaken on these lines in Germany by H. E. Weber, in Holland and Belgium, and in England by B. A. Miles (in the 1960s) and by E. S. Edees and myself. Unfortunately, there are no contemporary workers in France, though J. van Winkel, a Belgian, has located much, often useful, material in the dusty vaults of French institutions; but as yet the main herbarium of Sudre has not been located and may well be lost. All of us have found cooperation beneficial and there has been a good deal of complementary and parallel research taking place with a large measure of agreement ultimately about the results. Recently Newton & Weber (1977) published a list of species which we agree to be common to Britain and north-western continental Europe; a similar exercise in depth needs to be attempted with northern and north-western France especially, and tentative steps are being taken to arouse interest amongst our French colleagues. Fortunately, due to the presence of Genevieve's herbarium in Britain (originally purchased by Babington, it has now at last been reassembled at Cambridge) some work on the comparative taxonomy of French and British species has been possible (notably by W. C. Barton and H. J. Riddlesdell in the 1930s) and has been continued by Edees and myself, though there is room for a good deal of further research before we can be satisfied that the situation is fully understood.

One of the most important conclusions from recent research has been the realisation that distributional criteria offer the most fruitful methodology for establishing the relative importance of the various *Rubus* taxa; this, plus a taxonomic framework of 13 sections on the lines of that in Warburg (1962), containing all the clearly typified names of any member of the *R. fruticosus* group, is sufficient to establish a reliable *Rubus* list for any region. It is clear that the *Rubus* flora of a particular region can best be understood as a matrix of overlapping florulas (Fig. 1) each with its own central node or focus. It is necessary to define these carefully in the light of all the available evidence. There are two prime requirements:

- 1) An acceptable list of valid taxa (such as has been built up by Edees and myself for Britain over the last seven years and which is now fairly firm);
- 2) The formation of a *Rubus* information store in which data on the acceptable taxa can be stored and retrieved. The information we require is species number, locality, 10 km grid square, collector, date, whether herbarium or field record, name of herbarium, and authority for identity.

This information, now amounting to about 22,000 entries, is in course of collection from field visits and herbarium specimens; only material actually determined by Miles, Edees or myself is accepted, except for the most widespread and easily distinguished species. Taxa without valid names (so far as is known) also can be accommodated. From this store can be produced distribution maps for each taxon, county lists of all observations, lists of records for each taxon and numbers of species present in each 10 km grid square. These are of considerable value to many workers, such as county Flora writers and phytogeographers, but are particularly useful in directing the batologist's attention to underworked areas and in presenting distribution patterns graphically. Examination and analysis of this information produces fascinating results and indeed further questions about almost every species.

Recently (Newton 1975) I proposed eight distributional criteria as a framework for deciding the

TABLE 1. DISTRIBUTIONAL FRAMEWORK FOR *RUBUS* TAXA IN BRITAIN

| Classification |   | No. of British taxa |
|----------------|---|---------------------|
| 1.             | Widespread taxa (diameter of range more than 400km)     |                     |
|                | i) Taxa widespread in Europe                            |                     |
|                | a) naturalized aliens                                   | 5                   |
|                | b) density greatest on the Continent                    | 26                  |
|                | c) density greatest in the British Isles                | 24                  |
|                | d) density not differentiated                           | 33                  |
|                | ii) Taxa apparently endemic to the British Isles        | 26                  |
| 2.             | Regional taxa (diameter of range 50–400km)              | 113                 |
| 3.             | Local taxa (diameter of range up to 30km)               | 63                  |
| 4.             | Individual bushes or small populations unlike any other | not included        |
|                |   | Total 290           |

This total may be reconciled with the 388 *Rubi* recognized by Watson (1958) as follows:

|  |     |
|--|-----|
|  | 388 |
| less descriptions incorrectly ascribed to (mostly) Continental taxa                  | 197 |
|  | 191 |
| plus taxa to be retained on the British list though given as synonyms by Watson      | 26  |
| taxa given as synonyms or varieties by Watson but subsumed incorrectly to other taxa | 19  |
| taxa present in British Isles not mentioned  | 5   |
| taxa newly described since 1970  | 49  |
|  | 290 |

relative importance of *Rubus* species. After further thought and discussion, particularly with H. E. Weber, I have now modified this structure (Table 1).

One of the very interesting peculiarities of *Rubus* distribution is the occurrence of disjunct populations, sometimes hundreds of kilometres away from the main or nearest other populations; the concept of widespread taxa must allow for a disjunct qualification. In some cases the migration pattern of the Turdidae (thrushes) may be of significance, but there are also other possibilities. Some brambles clearly travel by rail. A good example is *R. tuberculatus* Bab. If one goes from Altrincham to Chester, Cheshire, v.c. 58, by rail in mid-June, when the flowers of this species are just opening, it seems as if there is one continuous plant all the way along the railway tracks. I have seen it in derelict sidings near Edinburgh and Dundee, in areas where it occurs in no other habitat. In other cases there are no obviously convincing reasons for the disjunct distributions. As an example, *R. dumnoniensis* Bab. is widespread in Devon and Cornwall and western Scotland but is scarce in south-western Wales and absent from North Wales to Galloway.

When we analyse the total number of named taxa now recognised in the British Isles we must remember that there are possibly over 1,000 which could be included in group 4, and up to 100 in group 3, which might be thought eligible for description if sufficient resources were available to perform the task. There are also about 20 in group 2 which are first in the queue to receive names. Table 1 analyses the data at present available. On this reckoning 70% of the named *Rubus* species in the British Isles may

be regarded as endemic, but this figure would undoubtedly rise if we took account of the additional 120 unnamed plants in categories 2 and 3.

Finally we come to the fascinating facts revealed by the study of the distributional data for each species, on which only a few comments will be made here.

1) As with some flowering plants with comprehensive distributions, certain taxa, e.g. *R. dasyphyllus* (Rog.) E. S. Marsh., are likely to be found almost wherever brambles grow. The most noteworthy feature of these species is their complete absence from some areas and their occurrence only as sparse isolated colonies in others, as if they are here submerged by the more vigorous development of regional and local taxa.

2) The number of species present decreases northwards; as exposure and lower winter temperatures become more severe, there is less suitable ground and diversity is reduced. In Caithness there are only 5 species; in South Devon, on the other hand, there are 62. In the whole of Scotland only the same number of species is present as in the average county in the Midlands.

3) Certain areas are particularly suitable for the greatest development of species; these tend to coincide either with long standing *Quercus robur* woodland on the richer loam soils or ancient *Quercus petraea* woodland in the lighter sandstone, drift or gravel terrace districts. It is noticeable that these areas have a markedly dissected topography and are also at some distance from the major (Weichselian) ice advance limits. The greatest development of brambles in general and of local and regional species in particular is to be found in these districts. A formation like the Lower Greensand provides a pathway for many continental species from Bedfordshire to North and South Devon. Of the 92 named species known in Herefordshire, 22 are local species and 28 are regional; of the 88 in Surrey 10 are local and 35 are regional. One is left with the thought that the most favourable ground for bramble development is also that which fortunately has proved least attractive to concentrated settlement and intensive agriculture. Where a knowledgeable enthusiast has been an inhabitant (e.g. A. Ley in Herefordshire) the local species are usually fairly well recognised and perhaps named; other districts such as North Essex and Merioneth have until recently existed in a pre-Linnaean state, batologically speaking.

4) When one attempts to map bramble distribution by distinctive communities, an interesting result appears. As may be seen in Fig. 1, Great Britain can be divided into six regions based on the distribution of the bramble florulas. In addition there are eight regional endemic complexes, numbered 1 to 8 in Fig. 1. Further micro-florulas exist, particularly in south-eastern England, e.g. along the North Downs, but are omitted on account of their small area. There is insufficient knowledge at present to describe or map the Irish bramble flora.

The Pennines form the western boundary of the north-western European influence (the other, eastern, end can be discerned in the Harz Mountains of Germany). From northern Norfolk to northern Scotland are to be found most of the brambles that we have in common with Holland, Germany and Denmark, e.g. *R. mucronulatus* Bor., *R. radula*, *R. septentrionalis* W. C. R. Wats., *R. anisacanthos* G. Braun, *R. plicatus* Weihe & Nees, a typical association which is almost if not completely absent from the Irish Sea, Severn Bay and Cornubian Florulas. Crossing the Pennines one enters a different batological universe. The western florulas have distinctive assemblages of their own, often unique to themselves and with only rare representatives (e.g. on the higher ground in mid-Wales) of the main north-western European species.

The South and Midland Florula contains all the species we have in common with northern and western France and Belgium, e.g. *R. insectifolius* Muell. & Lefev., *R. leightonii* Lees ex Leighton, *R. phaeocarpus* W. C. R. Wats., *R. formidabilis* Muell. & Lefev., *R. adscitus* Genev., *R. rufescens* Muell. & Lefev. Locally, however, they are swamped by the large endemic complexes of Archenfield, Ashdown, New Forest and Thames Valley. The Cornubian peninsula has a distinctive florula, from which most continental species appear to be absent, and at least one major endemic complex south and west of Dartmoor.



It is clear that careful analysis of bramble communities and their affinities and disaffinities has much to tell us about the vegetation history of the British Isles over the last 100,000 years or so, and its connections with the Continent. The foci of endemic complexes, no doubt of ancient origin, can be pinpointed. It is important to continue our researches not only into the status of the as yet unnamed regional taxa and to add to our knowledge of the distribution of the 290 recognised taxa, but also to reach for further affinities with the French connection, and perhaps to find some correlation with quaternary stratigraphy—can microspecies be distinguished by nutlet characters? There is much to do to integrate the bramble situation with other similar studies, both floristic and geographical. That this will be a fruitful area for new discoveries I do not doubt.

## REFERENCES

- DE TABLEY, LORD (1899). *Flora of Cheshire*, p. xxv. Chester.
- FOCKE, W. O. (1914). *Species Ruborum*. Monographiae generis *Rubi*, Prodrum, 3. *Bibliotheca bot.*, 83: 1–274.
- NEWTON, A. (1975). *Rubus*, in STACE, C. A., ed. *Hybridization and the flora of the British Isles*, pp. 200–206. London.
- NEWTON, A. & WEBER, H. E. (1977). *Rubi* common to the British Isles and north-western Continental Europe. *Watsonia*, 11: 380–382.
- SUDRE, M. H. (1908–13). *Rubi Europae*. Paris.
- WARBURG, E. F. (1962). *Rubus*, in CLAPHAM, A. R., TUTIN, T. G., & WARBURG, E. F. *Flora of the British Isles*, 2nd ed., pp. 371–380. Cambridge.
- WATSON, W. C. R. (1958). *Handbook of the Rubi of Great Britain and Ireland*. Cambridge.

(Accepted August, 1979)