The treatment of infraspecific taxa in local Floras

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ABSTRACT

One of the most valuable contributions a local Flora can make is to document the occurrence not only of subspecies but also of the currently unfashionable lower categories of varieties and forms. Their neglect in most recent identification works means that information on these taxa is difficult to find, a consistent approach to them is unavailable, and local Flora writers nowadays usually ignore them. Little information about them is therefore being collected, and there is a downward spiral of knowledge which needs reversing. Some remedies are suggested.

KEYWORDS: forms varieties, subspecies, infraspecific variation.

INTRODUCTION

The coverage of subspecies in recently published local Floras is very variable. Sometimes they are covered fully, and are even mapped like the species, but often they are either ignored or treated rather evasively. The coverage for Atlas 2000 also suggests that there is great variation in the way in which different recorders treat them and that in general we are not very good at recording subspecies, but I do not think there is any disagreement that we ought to treat them as seriously as we do species. Stace's *New Flora* (1997) certainly gives us no excuse for not doing so. We just need to try harder and do better. But infraspecific variation below the rank of subspecies, which is what I am mainly concerned with here, has been deeply unfashionable for fifty years or more and few of us nowadays take any notice of it. As enquiring field botanists we should surely wonder, when we see the obvious variation in so many species that is not described in Stace (1997) or in Clapham, Tutin & Moore (1987), what is going on. Is it geographical, is it ecological, is it entirely random, is it phenotypic or is it genetic? How can we find out about it? Should we record it, and, if so, how?

My own interest was heightened when in September 1994 Peter Sell and Gina Murrell paid a visit to my county of Cardiganshire. Among other sites, we visited the sea cliffs and coastal grassland at Gwbert where they demonstrated that what at a casual glance I would probably have recorded as a more or less uniform population of *Leontodon saxatilis* was in fact a mixture of *Hypochaeris radicata* subsp. *ericetorum*, *Leontodon autumnalis* var. *simplex* and *L. saxatilis* var. *arenarius*, familiar to them from other coasts of Britain. The first two seem to be widespread but the third is probably western in distribution. The distribution of all three in Wales was very poorly known, and none of them had been recorded before in the county. The same uncertainty held for *Cirsium arvense* var. *maritimum*, several of the varieties of *Lotus corniculatus*, the late-flowering prostrate and dwarf *Succisa pratensis* var. *maritima* and various other very distinctive taxa we found there. On the beach below my house at Aberystwyth they noticed *Galium aparine* var. *marinum*, a prostrate, condensed, late-flowering ecotype, growing with var. *aparine*, which ever since has bred true in my garden and which occurs, hitherto unrecorded, on several beaches in the county. Another variety of this species, late-flowering and dwarf, which is an arable weed forming globose clumps after harvesting, I have found only in the trial plots of the Welsh Agricultural College near Aberystwyth where it was probably introduced from what may be its main area of distribution in East Anglia. There are innumerable other examples of obvious but little known infraspecific taxa, and the problems and opportunities for extending our knowledge are endless.

HISTORICAL COMMENT

The lack of practical coverage of infraspecific variation has been deplored for as long as it has existed. Druce (1928), in the introduction to the second edition of his *British Plant List*, writes: "Compiled, as this *List* is, especially for field botanists, the varieties inserted are numerous (about 2400). Some botanists may resent their inclusion, but there are advantages in citing them, and it will rest with the writers of a new British Flora (a work so much to be desired) to relegate them, if necessary, to their more correct status." Unfortunately, when the new Flora of Clapham, Tutin & Warburg (1952) did appear 34 years later, the vast majority of these variants were not even relegated, they were just ignored, and the preface says: "It does not attempt to describe all named varieties or to give other details which a specialist might reasonably desire". The same approach prevailed in the later editions, encouraged by *Flora Europaea's* (Tutin *et al*. 1964–1980) similar attitude to varieties, and continued with Stace's *New Flora* (which, although ostensibly only going down to subspecies, does in fact include about a hundred atypical varieties or forms and many cultivars). Sell & Murrell (1997) say: "It is unfortunate that many botanists tend to ignore variation completely, and they will certainly ignore it if it has no name at all …", and Allen (1987) says: "under-recording is the stumbling block at present in seeking to interpret many easily recognised and recordable patterns of variation." As a result, there has for a very long time been no framework of infraspecific taxonomy for local Flora writers to follow and most of them, even if they would like to have included varieties, have, as Allen (1987) has observed, taken the easy option and followed their leaders in ignoring them. There has thus been a downward spiral of knowledge about much of the observable infraspecific variation. It is difficult to record it because we have no names or descriptions for it, and we cannot evaluate and name it because it is not being recorded.

On a national level there have been several attempts to bring the lower levels of variation back to our attention. In 1966 David Allen made a plea for better treatment of them at the local Flora writers' conference in Bristol (Allen 1967), and published in *Watsonia* (Allen 1966) a list giving details of all infraspecific taxa that had been tested in cultivation; this was an exemplary start that has, alas, not been followed up. Two B.S.B.I. Presidential addresses, by David Valentine (1979) and David Allen (1987), raised the standard but both failed to rally the troops. They make essential reading and provide much information on the significance of infraspecific variation. Tim Rich in the two versions of the *Plant Crib* (Rich & Rich 1988, Rich & Jermy 1998) brought together a great deal of comparatively up to date information, and did much to encourage botanists to record variation in more detail.

The one modern attempt to describe and evaluate the infraspecific variation of the British flora at all levels is Sell & Murrell's *Flora of Great Britain and Ireland* (1997–), of which only the monocot volume has so far been published. They say that "an attempt has been made to include all names used in British and Irish floras", although they admit that "No serious attempt has been made to decide on the correct infraspecific rank as taxa are often both ecological and geographical". As further volumes appear it should provide a very practical framework for recording. Because no-one has attempted this for at least the 75 years since Druce made his plea for a proper evaluation, there is bound to be controversy, but it is local Flora writers who are in the perfect position to try out Sell & Murrell's taxonomy. Local Floras ought to be one of the main ways in which information filters up to the national consensus of botanical knowledge. This still happens in matters of distribution and ecology, and the authors of species accounts in *Atlas 2000* constantly consulted and got much information from a number of recent county Floras in order to build up the general picture. Sell and Murrell, in contrast, have an extremely thin time of it, trying to get comparable information on variation from these Floras.

There have though been a few lone voices among local Flora writers. Webster (1978) in her *Flora of Moray, Nairn & East Inverness* went into admirable detail in a few cases, but it is Allen (1984) in his *Flora of the Isle of Man* who sets the modern standard and includes a vast amount of information on variation. Scott & Palmer (1987) in *The flowering plants and ferns of the Shetland Islands* are also very informative. Of other recent Floras, Bowen (2000) in *The flora of Dorset* and French, Murphy & Atkinson (1999) in their *Flora of Cornwall* have more on variation than most, and to some extent are exceptions to the general rule that there is a negative correlation between infraspecific detail and tetrad maps.

VALUE OF INFRASPECIFIC INFORMATION IN LOCAL FLORAS

Including information about variation makes a Flora vastly more interesting. Browsing through the Isle of Man or Shetland Floras gives one a much better impression of what makes these areas and their plants distinctive, and how they fit into the national pattern, than browsing through many other recent Floras. It inspires us to go out and see what this or that species is doing in our own patch. Infraspecific variation may often be the poor man's window onto genetic variation. Most of us are not in a position to study properly the genetic variation within populations – which is increasingly being recognised as a significant factor in conservation – but, as the morphological variation in many cases reflects the genetic variation, the recording of it as infraspecific variants should be a valuable exercise. For example, areas of coastal grassland with a large number of coastal ecotypes, to which we may be able to give varietal names, must surely be of considerable conservation interest; Valentine's (1979) comments on the variation in *Centaurea scabiosa* are very relevant here. Infraspecific variation may also be of great significance to those who study rusts, smuts, galls or phytophagous insects and may explain otherwise puzzling phenomena of distribution or partiality of these plant-related organisms. Cultivars are equally relevant here, and although, by definition, they are not going to be native plants they are often naturalised and very much part of the ecosystem, with their particular ecologies, diseases and resistances and differing abilities to survive in the wild.

A lot of infraspecific variation is probably not worth recording. It may be random, it may be unrelated to any meaningful geographical, ecological or other factor, or it may be a figment of a taxonomist's imagination, but in many cases we simply do not know. Only a small proportion of the observed variation has been properly investigated. By recording it, we can at least add to the information about it and help in the proper appraisal of its value. At the moment, most of us have little idea what is worth recording. Only what is in Stace? Surely not. Everything that will be in Sell & Murrell? Almost surely not. We just do not know. But nothing is lost by recording more than ultimately turns out to be worth while, and everything is lost by not recording it at all. Much of it will certainly be useful, and more useful than a lot of what we do spend our time recording. So how do we go about it?

SOURCES OF INFORMATION

I have mentioned some of the chief sources already. Sell & Murrell (1997–), in so far as it has been published, is of course the best available guide. Rich & Jermy (1998) is also essential. Every aspiring local Flora writer should look through the *Flora of the Isle of Man* (Allen 1984) at least once a year to be reminded of many of the things to look out for, and a few other recent Floras such as those of Dorset and Cornwall will provide useful snippets of information. Of the older national Floras by far the most useful is Druce's 1930 edition of *Hayward's botanist's pocket-book*; although out of date in its nomenclature and giving little or no evaluation of how worthwhile most of the infraspecific taxa are, it includes a vast number, especially in the often overlooked and unindexed appendices. The incomplete Williams's *Prodromus florae Britannicae* (1901–1912) and Moss's *Cambridge British Flora* (1914–1920) are also invaluable sources. A number of the older local Floras are useful and strongly recommended, especially those that give brief descriptions of the variants. Horwood & Noel's *The Flora of Leicestershire and Rutland* (1933) is one of the best, and Salmon's *Flora of Surrey* (1931), Keble Martin & Fraser's *Flora of Devon* (1939), White's *Flora of Bristol* (1912) and, though to a disappointingly lesser extent, Druce's county Floras, are also well worth consulting.

Many foreign Floras are very useful, with the ongoing *Flora Nordica* (Jonsell 2000–) being the most relevant up to date source; it is conveniently starting at the opposite end of the sequence of families to Sell & Murrell. Hegi's *Illustrierte Flora von Mittel-Europa* (1906–) and Rouy & Foucaud's *Flore de France* (1893–1913) contain vast numbers of variants that also occur in Britain. All these provide good descriptions of the variants. The 2400 variants in Druce (1928) are unfortunately not described, although many are in Druce (1930). Other useful lists include Akeroyd (1997) which covers infraspecific variants of European coastal species. Cultivars are notoriously difficult to identify, and the language and identification methods used by

horticulturalists are often quite different from what local Flora writers are used to; but a lot can be gleaned from the numerous Royal Horticultural Society publications, and various books by W. J. Bean, G. Krüssman, A. Rehder, Alan Mitchell, Roger Phillips and the like. An outstanding recent taxonomic account of cultivars is Kuitert (1999) on *Japanese flowering cherries* (street trees are considered fair game for Flora writers in many other parts of the world, but have not usually been covered in this country). Another is Bishop, Davis & Grimshaw (2001) on *Snowdrops*. Crawley (2002) has bravely begun to tackle the problems of identifying the more commonly naturalised of the myriad of daffodil cultivars, but as there are about 26,000 names in the latest RHS Register (Kington 1998) it is not going to be easy to decide which to cover.

Much of the information scattered in journals such as the *BEC Reports* and *Watsonia* is not easily traceable, although the appendices in Druce (1930) to some extent act as an index to the former; the latter is soon to have a cumulative index. Some time ago, David Allen assembled all the published and much unpublished information on infraspecific taxa in Britain. This treasure trove is now at the National Museum of Wales, Cardiff, and Tim Rich is hoping to use it as a basis for a list of infraspecific taxa with details of the sources (it would be especially valuable if this could again include information on the results of cultivation experiments). A project to update and evaluate all this information and make it available as some sort of infraspecific Flora remains a long term aim, but how this would relate to Sell & Murrell is uncertain. Meanwhile these files at Cardiff can be consulted by anyone interested. Many other sources are available. Mary Briggs (2000) in her Presidential address showed how an alert and energetic local botanist can both learn from and contribute to the work of botanists operating in a wider field, and this certainly applies to problems of infraspecific taxonomy. Experts are perhaps likely to be more interested in the variation of one's local plants than in tetrad maps of their distribution, and there are many opportunities for getting them involved.

Another great source of information is in herbaria, but these are no longer being added to as much as in the past and a lot of variation is inadequately represented in them. Valentine (1979) in his Presidential address said: "Certainly, indiscriminate collecting is not desirable, but intelligent collecting, in which the specimens are treated as samples of a population and collected with ecotypic variation, polymorphism, or hybridization in view, are doubly valuable in that so few series of this kind are to be found in our large herbaria." Specimens put into a major herbarium are of course most likely to be looked at by experts, who should in return help us by naming them more critically, so there is mutual benefit all round. Ideally, certain items of information in a local Flora should always be underpinned by specimens deposited in a local or national herbarium.

METHODS OF PRESENTATION

It is helpful to indicate to what extent one has tried to cover infraspecific variation, and it is surprising how rarely this is done. For all the authors tell us, the plants of the Isle of Man may really have ten times as much infraspecific variation as those of Flintshire, as the Flora of neither area tells us what their policy is for including or commenting on these variants. If a species is not in a county Flora, we can assume it is not there, but if a variety is not mentioned we usually do not know whether it is absent on the ground, or deliberately left out of the Flora, or perhaps just absent from the author's mind. In particular, it is helpful to cover the variation recognised in earlier local Floras of the same area. Do forms of *Anthyllis vulneraria* approaching var. *coccinea* still occur in Leicestershire, and does *Veronica scutellata* var. *villosa* still occur at Groby Pool, as Horwood & Noel (1933) recorded? What is the current status of the rayed form of *Senecio vulgaris* in the Bristol region, discussed at length by White (1912)? The more recent floras of these areas do not tell us, but it would surely be interesting and useful to know. A particularly poignant example of continuing lack of information is *Iris foetidissima* var. *citrina*, the yellow-flowered variant, for Allen (1987) in his Presidential address mentions it as his favourite among variants which "are so conspicuous that it is hard to believe that their distribution is not known with tolerable completeness"; he cites records from Bath and Devon through Dorset to the Isle of Wight. Yet, since then, I think only the Dorset and Somerset Floras mention it, although there is a specimen in **BM** from Kent and it is mentioned by Simpson (1982) from Suffolk. Sell & Murrell can give no information on its ecology and distribution and just say that they require further study.

There is an almost insurmountable problem in knowing how to indicate that variants do not occur in one's area. It is tedious to repeat under each species "no significant variation occurs". In selected cases it may be worth saying "all populations seen are of the glabrous form" or "only yellow-flowered plants occur" or whatever. The Shetland Flora often gives species in the form "*Sonchus asper* (L.) Hill subsp. *asper*," and since in the Explanatory Notes the authors say that for nomenclature they have in general followed *Flora Europaea*, we can assume that they mean they have not got subsp. *glaucescens*, which is the other subspecies recognised in *Flora Europaea*. This convention is of course not practicable for varieties when there is no standard work to follow (although it should become more possible as Sell & Murrell is completed or an annotated Allen/Rich list becomes available). Unless one makes clear in each case what standard one is following, it is impossible to know what one is including or excluding by the use of a name. For example, were one to list *Lotus corniculatus* var. *corniculatus*, if one is following Stace (1997) it means it is not var. *sativus*, but it might still be var. *crassifolius* or var. *incanus* in the sense of Druce (1930); if one is following Druce (1930) it means that it is not the latter two varieties, but might still be var. *sativus*. In many cases it will be obvious what one means, but the best solution may be to do what Horwood, Salmon and Allen do and make one's Flora interesting and helpful by including a little descriptive gloss, such as: "Most populations are var. *corniculatus*, fleshy-leaved plants (var. *crassifolius*) have not been seen, and plants with densely hairy leaves (var. *incanus* or var. *hirsutus*) are confined to the limestone and to dry, sandy banks; the robust, hollow-stemmed var. *sativus* is frequent on reseeded roadside verges." Varieties and forms, almost by definition, tend to be definable by a very few characters, so this is usually easy. It may be argued that this takes up too much room, but it is the sort of information that makes a local Flora worthwhile and readable. It is also essential to say if one cannot distinguish variants recognised in whatever standard one is following and has therefore deliberately ignored them. It is no disgrace to say that one has been unable to distinguish the subspecies of *Sedum telephium* or even of *Molinia*, and it is more honourable than saying nothing. It may also of course be genuinely useful to say that they are just not distinguishable in a particular area.

CONCLUSION

Druce had 2400 varieties in 1928, and there must be very many more by now; there is no available estimate, and still less any estimate of the number worth recording. No local Flora writer is going to be able to include more than a small proportion, but virtually any information on these infraspecific taxa is going to be a contribution to our knowledge of variation and will be worth the effort. So often when one goes out with colleagues in their own patch they show one fascinating features of the local plants, including all sorts of infraspecific variants, but when they come to write the county Flora most of this seems to get left out and what makes their county so interesting is lost. We should all try harder to write the sort of Flora that does justice both to the authors and the plants, and that contributes more information to botany in general.

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