BSBI News

April 2013 No. 123

Botanical Society of the British Isles

Edited by Trevor James & Gwynn Ellis

ISSN 0309-930X

Eric Clement botanising at Thorney Island in October 2011. Photo G. Hounsome © 2011
(see p. 66)

Spartina patens in saltmarsh on the east side of Thorney Island. Photo G. Hounsome © 2012
(see p. 66)

Frankenia laevis (Sea-heath) growing over roadside kerb, Helmsley-Kirbymoorside road, North Yorks. Photo N.A. Thompson © 2009 (see p. 48)

Carex ×*gaudiniana* Glen Shee, Cairnwell, v.c.92. Photo M. Wilcox © 2012 (see p. 28)

Paul Green (acting Welsh Officer) at The Raven, Co. Wexford. Photo O. Martin © 2008 (see p. 86)

Alchemilla wichurae, Teesdale, showing 45° angle of main veins. Photo M. Lynes © 2012 (see p. 25)

Pentaglottis sempervirens, Kirkcaldy, Fife (v.c.85). Photo G. Ballantyne © 2012 (see p. 64)

CONTENTS

Cover picture – : Inflorescence of *Spartina patens* at Thorney Island in August. Photo G. Hounsome © 2012 (see p. 66)

IMPORTANT NOTICES

From The President

IAN BONNER, *Cae Trefor, Tyn y Gongl, Anglesey, LL74 8SD*
(01248 852651; BSBI@caetrefor.co.uk)

As I write this, in late March, I see little sign of spring - indeed many of the new shoots are now looking very bleached in the strong easterly winds - but at least Anglesey is not snow covered!

You will find your copy of our Annual Review 2012 enclosed with this issue of *News*. This will give you a good overview of our many recent activities and my thanks go to all who contributed to putting together the Review document.

Field Secretaries are to be congratulated on assembling a really comprehensive programme in the 2013 *Yearbook*, spread across Britain and Ireland and catering for a wide range of expertise. As a new venture, the beginners' plant identification course described in the January *News* is up and running, with a full quota of tutors and students, which is brilliant news. Thanks go to Brenda Harold and all of you who are helping with this.

One really exciting piece of news is that the Society has appointed a Head of Operations to improve the coordination and management of all activities. We are delighted to welcome Jane Houldsworth, from Bromley Cross, Bolton, who will be joining us at the beginning of June and expects to be at the AGM in Beaumaris later in the month to meet many of our members.

Progress towards reconstituting the Society as a Company Limited by Guarantee continues and you will find the relevant items amongst the AGM papers included with this copy of *News*. Special thanks are due to Antony Timmins, our Honorary Treasurer, for continuing to oversee this important matter.

It is really good that so many of you have booked to come our AGM and the associated field visits. I look forward to welcoming you to Anglesey and just hope we get decent weather!

Notes from the Editors

TREVOR JAMES (Receiving Editor), 5*6 Back Street, Ashwell, Baldock, Herts., SG7 5PE*.
(Tel.: 01462 742684) (trevorjjames@btinternet.com)
GWYNN ELLIS (General Editor), *41 Marlborough Road, Roath, Cardiff, Wales, CF23 5BU*
(Tel.: 02920 496042) (membership@bsbi.org.uk / rgellis@ntlworld.com)

Tim Rich has drawn our attention to a matter of some significance for anyone carrying out botanical research on any plant group.

The Royal Botanic Garden, Edinburgh, has posted details of apparent mass plagiarism by an Estonian-based academic, Boris Lariushin, on its website:

(http://stories.rbge.org.uk/archives/1321).

Multiple volumes on various plant families have been produced, their material apparently having been 'lifted' from web-based publications elsewhere, without permission or acknowledgement.

If any members feel they may be the target of plagiarism by this individual, we suggest they examine the information posted by Mark Watson of RBGE, and take action accordingly.

Apologies to Su Cooper for wrongly announcing her demise in the last issue; the result of a mistake by her bank!

Thanks to all who sent copies of old journals if any have not received postage please get in touch.

Through lack of space here, see p. 8 for details of members with whom we have lost touch.

News of the untimely death of **Richard Pankhurst** reached us just as we went to press. His skills as a botanist and computer programmer were instrumental in the setting up of the BSBI database, Leicester. He will be greatly missed.

NOTES

Eleocharis mitracarpa Steud., not a British plant

F. JEREMY ROBERTS, *Eden Croft, 2 Wetheral Pasture, Carlisle, CA4 8HU*; (fjr@edencroft2.demon.co.uk)

Introduction

On taking up the post of BSBI referee for *Eleocharis* (spike-rushes) in 2008, I began to address a few spike-rush 'loose-ends'. One such was prompted by the statement in *Sedges of the British Isles* (Jermy *et al.,* 2007, p. 125):

> "Recent studies into *E. palustris* and related species by G.A. Swan have revealed the possible presence of a further species, *E. mitracarpa* Steud., in the British flora. This species is distinguished from *E. palustris* by having the style-base wider than long and mitriform and by the glumes having a very wide hyaline margin (Walters 1980)".

E. mitracarpa also features as a species entry in the recent *Flora of Cardiganshire* (Chater, 2010).

I am most grateful to Arthur Chater (AOC) for copying me an unpublished draft (*c*. 2004) by Prof. Swan ('Possible occurrence of *Eleocharis mitracarpa* Steudel in Britain'), which describes the identification of Scottish and Welsh specimens as putative *E. mitracarpa*. It should be emphasised that Prof. Swan appears not to have formalised his views on this matter, and that the references to the name *mitracarpa* in the two publications were intended to stimulate further investigation.

This has been my intention in the preparation of a discussion document, the main conclusions of which are summarised here. Interested readers are, however, invited to download the document itself, fully argued and illustrated, including the relevant datasets, from my website – details at the end of this note.

Briefly, Prof. Swan's interest had been aroused, in 2002, by specimens in **E** from Midlothian. Others collected by AOC from Cardiganshire in 2005 were described by Prof. Swan as "identical with" some of the Scottish specimens.

Prof. Swan apparently saw in both sets of specimens glumes with wide hyaline margins and the style-base (stylopodium) wider than long, and 'mitriform' – mitre-shaped, with a convex outline: characters of the eastern *E. mitracarpa,* as given in various relevant floras.

Professor Swan died in October 2012, at the age of 95.

Status and identification of *Eleocharis mitracarpa* Steudel

At the outset it is essential to grasp the often-overlooked distinction (overlooked at least in the UK) between the two subspecies of *Eleocharis palustris* (Common Spike-rush). The familiar UK plant belongs to the tetraploid subspecies *vulgaris,* which has a relatively limited range across central, western and northern Europe. The diploid subspecies *palustris* appears to be rare and southern in UK, but has a far greater world range extending eastwards across Eurasia, where (depending upon taxonomic interpretation) it is represented by related forms, one being *E. mitracarpa*.

Sven-Olof Strandhede's monumental work (1966) remains the authority on the European taxa of this group. Strandhede was somewhat dismissive of *E. mitracarpa* and other closely-related named forms, regarding them as eastern variants of the widespread subspecies *palustris,* although he avoided "making any definitive evaluation of their taxonomic status" (p. 117), as being beyond his remit in this paper. However, the taxon appears at the rank of species in various floras covering far south-eastern Europe eastwards.

It is clear that in such floras the characters given for *E. mitracarpa* are intended to distinguish it from *E. palustris* subspecies *palustris*

(since that is the *palustris* form in the east). There is no intention, however, to distinguish *mitracarpa* from *palustris* subspecies *vulgaris* by these characters, since the two are well-separated in range, and *vulgaris* therefore not in contention. (A related concern arises in the key and accounts in *Flora Europaea*, which I address in a separate note (Roberts, 2013).)

Crucially, those two characters – wide hyaline glume-margins, and stylopodia wider than long – are routinely displayed by our local subspecies *vulgaris,* as was stated by Strandhede nearly fifty years ago. Any diagnosis of *E. mitracarpa* in the UK based solely upon these two characters is therefore confounded from the start.

For the type specimen of *E. mitracarpa,* Strandhede gives a stylopodium length of 0.5-0.6 mm and width of 0.7 mm, hence rather wider than long, a length:width ratio of *c.* 0.7-0.85. Of the stylopodium of subspecies *vulgaris,* Strandhede remarks: "The length is often smaller than the width, in contrast to the most common conditions found in ssp. *palustris*" (p. 79). Within my own UK collections, it is easy to find samples of subspecies *vulgaris* (the identification supported by stomatal length – see below) in which some stylopodia are similarly low and convex. Fruits from a Ribblesdale (v.c.64) collection have the stylopodium length:width ratio varying from 1.12 (rather longer than wide), to well below unity, in this sample down to 0.63 (much wider than long).

Referring to the glumes, Strandhede says: "The hyaline margins of [subspecies] *palustris* are usually narrow or lacking in the young spikes, but during the summer they grow broader, when the glumes become increasingly hyaline", whilst for *mitracarpa*, his only comment is that the "glume colours vary widely from nearly white to dark brown", perhaps implying that 'hyaline margins' can vary from full-width to absent. For subspecies *vulgaris* he says, "the glumes of *vulgaris* have distinct, often conspicuously broad, silvery, hyaline margins" (p. 46). Hence, although the character of "wide hyaline margins" might possibly allow some *mitracarpa* to be separated from subspecies *palustris,* perhaps in the early season, what it patently fails to do is distinguish *E. mitracarpa* from subspecies *vulgaris*.

Ribblesdale samples of subspecies *vulgaris* have hyaline glume margins which average 54% of the glume width measured 2 mm below the tip (*i.e.* at about the midpoint), thus substantially wider than Komarov's (1976) definition of what should constitute a 'wide' hyaline margin, *viz*. a third – the only source I have found which actually defines width of margins.

The *Flora Europaea* account (Walters, 1980, p. 283) makes no mention of hyaline margins in *E. palustris*. One could therefore be tempted into believing that presence/absence of a hyaline glume margin was a good diagnostic character between *mitracarpa* and either subspecies of *palustris*.

As a further pointer, Strandhede (p. 45) suggests that glume length has some diagnostic value between diploid and tetraploid, being in the diploids (*palustris* subspecies *palustris* and *mitracarpa*) smaller in most instances (about 3 mm) than in the tetraploid *vulgaris* (at least 3.5 mm).

What other characters do we have? Characters which correlate most strongly with ploidy level, according to Strandhede, are stomatal length and pollen grain size: "The stomatal length of [subspecies] *palustris* ... has great diagnostic interest in relation to [subspecies] *vulgaris.* The mean values of the Scandinavian and Finnish samples of *palustris* cultivated reach between 38 and 50 µm, and those of *vulgaris* between 54 and 70 µm" (p. 29). These ranges are broadened somewhat in Strandhede & Dahlgren (1968), where the overall ranges are given – I believe with greater clarity and applicability – as:

(diploid) subspecies *palustris* (35-) 39-49 (-56) µm

(tetraploid) subspecies *vulgaris* (50-) 54-70 (-77) µm

These figures are used in both *Flora Europaea* and *Sedges of the British Isles*. Note that they refer to mean values. Whilst there is some overlap, the mean stomatal length should be

diagnostic for the ploidy level, and hence subspecies, in the great majority of specimens (assuming that UK plants match the Scandinavian data – *Flora Europaea* remarks that "The taxonomic distinction is less easy to make in much of Central Europe than in Britain and Scandinavia").
Mean stomatal length should also hold good for *mitracarpa*, as this falls into "the micromorphological characters which are common for the whole subspecies *palustris*" (p. 113). (The specimens I examined had too little remaining pollen to use with any degree of confidence.)

The Scottish specimens
Whilst I was looking into this matter in early 2012, Prof. Swan was sadly already frail, and on advice, it was felt inappropriate to trouble him for loan of the Scottish and Welsh specimens named as putative *E. mitracarpa*. However, through the good offices of Douglas McKean (DMcK), I was able to examine the actual v.c.83 specimens (in **E**) which initially 'caught the eye' of Prof. Swan in 2002.

The stomata of a specimen from Glencorse Reservoir gave a mean of 62.7 µm (s.d. = 3.3; n = 40). Mean glume length was 4.10 mm (s.d. = 0.22; n = 11). Thus this collection has stomatal and glume lengths commensurate with *palustris* subspecies *vulgaris* (as DMcK had previously annotated the specimen). Widths of the hyaline glume margins were not measured, but can be readily judged from photos in the online document. The glumes closely match those from a number of *vulgaris* specimens in my own collection, such as those from Ribblesdale already mentioned.

Spikes of a specimen from Bush Estate, Penicuik, were small, immature and poorly developed. Stomata from several stems gave a mean of means of 70.3 µm (s.d. = 2.4; n = 40). This is at the upper end of Strandhede's range for subspecies *vulgaris*, and can only be referred here. The single glume measured, at 3.89 mm, also fits here.

DMcK also very kindly sent a number of other specimens from these sites, retained from collections made at Prof Swan's request in 2003. These were in all respects close to the two specimens above, most significantly in stomatal length (62.0-71.5 µm) and glume length (3.83-4.84 mm): all were clearly in the range of subspecies *vulgaris.*

In autumn 2012, some months after the work just described, a small polythene packet came to light amongst other material in my herbarium. I recognised it as being a collection sent to me by Prof. Swan in (about) 2004 during the many exchanges we had had in connection with his ongoing studies into *Eleocharis austriaca,* but mislaid over the years since. This bag contained not only some spike-rush fruits but also – most usefully, and not in accord with my vague memory of it – a spikelet and lengths of stem. A label written in Prof. Swan's hand says "*cf. Eleocharis mitracarpa,* Bush Estate NT247.607, 04.09.02. Collected by D.R. McKean". (The "0" in the grid-reference, not distinctly written, may be a transcription error; the reference should probably be NT247.637 as given earlier.)

Embarrassing as it is to admit, here was an actual specimen named by Prof. Swan, overlooked in my collection! The specimen proved to be a close match with the other Bush Estate specimens already examined, with hyaline glume-margins of similar width, mean stomatal length of 71.6 µm (s.d. = 3.9; n = 40), and glumes 4.09, 4.11, 4.20 mm (n = 3). There seemed no reason to place this elsewhere than in *palustris* subspecies *vulgaris.*

The Welsh specimens
In 2004 AOC sent some Cardiganshire *Eleocharis* specimens to Prof. Swan for comment on possible hybridity. In Swan's opinion (as stated in the unpublished note) some of these appeared to be identical with the specimens from Bush Estate. These specimens were retained by Prof. Swan. Without sight of the originals, I would accept his view that they appeared identical to the putative *mitracarpa* from Bush Estate, which leads to the assumption that the Welsh plants would also be referable to subspecies *vulgaris.*

Discussion

It appears that the identification as putative *mitracarpa* was based on just two characters, stylopodium shape and width of hyaline glume margins. However, these two characters are closely matched between *mitracarpa* and our *palustris* subspecies *vulgaris.* Since *mitracarpa* and subspecies *palustris* are diploid, evidence of a diploid plant in Scotland or Wales would have been of great interest, but none has emerged.

It is clear that Prof. Swan was fully familiar with Strandhede's publications. He would thus most certainly be aware of the "great diagnostic interest" of stomatal length as a strong confirmatory character for putative *mitracarpa*, versus subspecies *vulgaris.* Yet, curiously, there is no mention of stomata in the unpublished note. What there is, however, is a conjecture that 'British *mitracarpa*' might be tetraploid. (Note that although not made explicit, this anticipates the longer stomata that these specimens actually show, contrary to what would be expected in *mitracarpa.* I discuss these points further in the online document.)

It is possible that a plant such as *E. mitracarpa* might occur as an introduction in the UK, and could be detectable (if diploid) within populations of subspecies *vulgaris* by its similarity to subspecies *palustris* in the critical characters, especially stomatal length. But I found no hint of this. I do not think I need to labour the point that proposing a 'tetraploid *mitracarpa*' in the UK, native or introduced, is a lost cause, without support from chromosome and DNA analyses of all the related forms across Eurasia.

There seems good reason to conclude that the specimens examined sit comfortably within *E. palustris* subspecies *vulgaris,* and that *E. mitracarpa* has not been confirmed in UK.

Website

The full discussion document is downloadable at: www.edencroft2.demon.co.uk/spikerushes/mitracarpa.html

Acknowledgements

I am greatly indebted to Arthur Chater and Douglas McKean variously for discussion, advice, copies of notes and correspondence, loan of specimens, etc. Mike Porter commented most usefully on the draft. Nigel Blackstock first drew my attention to Strandhede's 1966 monograph some years ago, although I little knew at the time how closely and attentively I would later need to digest it!

References:

BUREŠ, P., ROTREKLOVÁ, O., HOLT, S.D.S., & PIKNER, R. (2004). 'Cytogeographical survey of *Eleocharis* subser. *Eleocharis* in Europe 1: *Eleocharis palustris*'. *Folia Geobotanica*, 39: 235–257.

CHATER, A.O. (2010). *Flora of Cardiganshire*. Privately published, Aberystwyth.

GREGOR, T. (2003). '*Eleocharis mamillata* – distribution and infraspecific differentiation'. *Folia Geobotanica*, 38: 49–64.

JERMY, A.C., SIMPSON, D.A., FOLEY, M.J.Y., & PORTER, M.S. (2007). *Sedges of the British Isles,* Botanical Society of the British Isles, London. BSBI Handbook No. 1 (Ed. 3).

KOMAROV, V.L. (ed.) (1976). *Flora of the USSR (Flora SSSR).* Botanicheskii Institutt, Akademii Nauk, Moscow & Leningrad.

ROBERTS, F.J. (2013) *Eleocharis*: problems with the *Flora Europaea* account. *BSBI News*, **122**: 7–8

STRANDHEDE, S.-O. (1966). 'Morphologic variation and taxonomy in European *Eleocharis*, Subser. Palustres'. *Opera Botanica*, 10:2, 1-188.

STRANDHEDE, S.-O. & DAHLGREN, R. (1968). 'Drawings of Scandinavian plants 9-10'. *Botaniska Notiser*, 121 (1) : 1-10.

WALTERS, S.M., in TUTIN, T.G. *et al.,* (eds.) (1980). *Flora Europaea,* vol. 5: 283. Cambridge University Press, Cambridge.

Eleocharis: problems with the *Flora Europaea* account

F. JEREMY ROBERTS, *Eden Croft, 2 Wetheral Pasture, Carlisle, CA4 8HU*; (fjr@edencroft2.demon.co.uk)

I believe the key to the '*E. palustris* group' in vol. 5 (p. 283) of *Flora Europaea* (Walters, 1980) has a number of issues affecting the identification of *E.* (*mamillata*) *austriaca* and *E. palustris*.

The key with *E. austriaca*

Couplet 3, choice 1 ("Stylopodium at least twice as long as wide"): this description of the stylopodium (style-base) of *E.* (*mamillata*) *austriaca* applies – as I understand it – only to extreme forms. It may be that the stipulation derives from a drawing in Strandhede & Dahlgren (1968), p. 5, fig. 1, which has a stylopodium with a length or height (as drawn) of 9.0 mm and width of 4.35 mm, to give a ratio of about 2.06. That drawing appears in turn to be based upon some *austriaca* fruits in the photo in Strandhede (1966), p. 58, *e.g.* fig. 7c, although not others in the same photo, in which the stylopodium is more widely conical, with a length:width ratio of about unity.

A ratio of two or more would seem to exclude the great majority of *austriaca* plants, which have a ratio lower than 2:1, as is clearly demonstrated by Gregor (2003), fig. 3, lower graph (in which 'stylopodium form' is length/width ratio).

Quite typical plants of *austriaca,* with less tall stylopodia, therefore fail to resolve at couplet 3. At couplet 4 there is then an insoluble conflict:

choice 1 ("Stylopodium longer than wide; bristles 4, rarely 0"), the stylopodium shape may agree, but the bristle-count is consistently five;

choice 2 ("Stylopodium wider than long; bristles 4-8"), the bristle-count will agree, but the stylopodia are mostly too tall.

Certainly one would have to say that no British plants of *austriaca* – from sites in Wharfedale (v.c.64), Northumberland (v.c.67), and Cumberland (v.c.70), which the same author had earlier identified with *austriaca* (Walters, 1963) – could be keyed out successfully with the *Flora Europaea* key. British plants in the main have lower stylopodia, with a length:width ratio much lower than 2, and approaching unity. They do however closely match many of the Strandhede (1966) photos, p. 58, figs. 7e and 7f, and less commonly 7d.

Occasional British plants of *austriaca* can be found with some stylopodia with a length:width ratio rather less than 1 (see Swan & Richards, 2007). Such plants might agree with couplet 4, choice 2, but then at couplet 5, the likely selection would be choice 2 ("Bristles (5-)6-8; glumes with narrow hyaline margin"), leading to an identification of *E.* (*mamillata*) *mamillata*, a plant not yet known in the UK but recognised by its lower, broader, and often mamillate, stylopodia, and mostly six bristles. These bristles, for clarity, are the perianth bristles surrounding the base of the nut.

The key with *E. palustris*

Couplet 4 uses stylopodium length:width ratios to distinguish *palustris* (the whole species) from *mitracarpa* and *mamillata,* thus, choice 1: "stylopodium longer than wide" for *palustris;* choice 2: "stylopodium wider than long" for *mitracarpa* and *mamillata.* The choice "stylopodium longer than wide" as given above for the species *palustris* might well fit most examples of ssp. *palustris* (the rare subspecies in the UK), but it seems to ignore the many forms of ssp. *vulgaris* (the common subspecies in the UK) in which the "length is often smaller than the width" (Strandhede, 1966: 79) – "often" being a key word here. Hence, an entirely normal sample of ssp. *vulgaris* would carry to couplet 5, where – with "bristles 4(-5)" – it would key out as *mitracarpa*, especially if the glume margins were conspicuous, perhaps in the later season, when "wide hyaline glume margin" would attract.

Bristles are mentioned at couplet 4, but only to indicate that species *palustris* has none in

some forms (four in the majority), whilst *mitracarpa* has "4(-5)" and *mamillata* "(5-)6-8". Since Strandhede mentions that the *mitracarpa* type specimen itself also lacks bristles, at couplet 5 (choice 1) "bristles (0)4(-5)" might accord better with the literature.

The actual species account for *E. mitracarpa* states: "Like 8 [*i.e.* the whole species *palustris*] but glumes usually with a wide hyaline margin; stylopodium mitriform, wider than long". If Strandhede (1966) is to be followed, then this description might separate *mitracarpa* from *palustris* ssp. *palustris* (from which *mitracarpa* would need to be distinguished in its middle- or far-eastern range), but many specimens of the (allopatric) ssp. *vulgaris* fit these characters well. The account would be more valuable if the relationship between (or indeed possible synonymy of) *mitracarpa* and *palustris* ssp. *palustris* were brought out, both being diploid, and with shorter stomata, versus the tetraploid ssp. *vulgaris*, with its longer stomata (see also Roberts (2013), in this issue).

The following is offered as an alternative key for fertile stems of the *palustris* group (*i.e.* not for the whole of *Eleocharis*), for use in the UK (where only four taxa of the *palustris* group are known). Confirmation of *E.* (*mamillata*) *austriaca* might need to make use of stem epidermal characters, which can also obviously enable identification of non-flowering material. There is much more information on my website (details below).

Alternative key to fertile *E. palustris* group (UK species)

1 Only the lowest glume of spikelet empty, largely encircling base of spikelet *uniglumis*
1 Two lowest glumes empty, ± equal, each half-encircling base of spikelet 2
2 Stems brittle; spikelets often conical; style-base small, not obviously swollen; bristles mostly 5 *austriaca*
2 Stems pliable; spikelets ovate or cylindric, rarely strongly conical; style-base large, swollen; bristles (0)4 *(palustris)* 3
3 Glumes from middle of spikelet less than 3.5 mm; mean stomatal length (35-) 39-49 (-56) µm *palustris* ssp. *palustris*
3 Glumes from middle of spikelet more than 3.5 mm; mean stomatal length (50-) 54-70 (-77) µm *palustris* ssp. *vulgaris*

Website: www.edencroft2.demon.co.uk

References:

GREGOR, T. (2003). '*Eleocharis mamillata* – distribution and infraspecific differentiation'. *Folia Geobotanica*, **38**: 49–64.

ROBERTS, F.J. (2013). '*Eleocharis mitracarpa* Steud., not a British plant'. *BSBI News*, **123**: 3–6.

STRANDHEDE, S.-O. (1966). 'Morphologic variation and taxonomy in European *Eleocharis*, Subser. Palustres'. *Opera Botanica*, **10(2)**: 1-188.

STRANDHEDE, S.-O. & DAHLGREN, R. (1968). 'Drawings of Scandinavian plants, 9-10'. *Botaniska Notiser*, **121(1)**: 1-10.

SWAN, G.A. & RICHARDS, A.J. (2007). 'The *Eleocharis mamillata* H. Lindb. *fil.* aggregate (Cyperaceae) in the British Isles'. *Watsonia*, **26(3)**: 317-325.

WALTERS, S.M. (1963). '*Eleocharis austriaca* Hayek, a species new to the British Isles'. *Watsonia*, **5(6)**: 329-335.

WALTERS, S.M., in TUTIN, T.G., *et al.,* (eds.) (1980). *Flora Europaea,* V: 283. Cambridge University Press, Cambridge.

Where are they now?

If any member knows the current whereabouts of any of the following members I would be pleased to hear from them.

Dr D Briggs, Wolfson College, Barrow Road, Cambridge, CB3 9BB

Ms S Oldfield, The Old Plough, 2 Caxton Road, Great Gransden, Sandy, Beds, SG19 3BE

Mrs M Lindop, Newburn, Borrowby, Thirsk, YO7 4QP

Miss N L de Vere, 3 Pines Road, Paignton, Devon, TQ3 3PG

Mr M Stevenson, Wey Cottage, Church Street, Old Woking, Surrey, GU22 9JE

Further studies of Sea-lavenders on the Ribble Estuary at Marshside, north Merseyside

PHILIP H. SMITH, *9 Hayward Court, Watchyard Lane, Formby, Liverpool, L37 3QP*
PATRICIA A. LOCKWOOD, *13 Stanley Road, Formby, Liverpool, L37 7AN*

Smith & Greenwood (2009) described the discovery in August 2008 of *Limonium vulgare* (Common Sea-lavender) and *L. humile* (Lax-flowered Sea-lavender) at Marshside, north Merseyside (v.c.59, South Lancashire). *L. humile* was a first vice-county record, while *L. vulgare* had not been confirmed in South Lancashire since 19th century records on the Mersey Estuary. Ten specimens of *L. vulgare* and three of *L. humile* were found (Table 1; Fig. 1, p. 10) in a pioneer saltmarsh in the vicinity of SD344194, the vegetation showing good agreement with the UK National Vegetation Classification's SM13a: *Puccinellia maritima* saltmarsh, typical sub-community (Rodwell, 2000).

Further careful searches of the Marshside saltmarsh took place in August 2010 and 2012, the numbers of *Limonium* plants being counted and their locations determined using a hand-held GPS device. Both taxa had increased considerably by 2010, when 61 individuals of *L. vulgare* and 12 of *L. humile* were recorded. In addition, two putative specimens of the hybrid *L.* × *neumanii* were noted and photographed (See Colour Section, Plate 4 & Table 1). Identification was based on intermediate morphological characteristics, mainly of the inflorescence. Stace (1975) wrote:

> "Recognition of the hybrid is difficult because of morphological variability of the parents. British hybrids are reported to be monomorphic with fertile pollen but reduced seed-set……Introgression is claimed at two Norfolk localities."

In addition, leaf stomata were examined with a hand-lens, the putative hybrid having stomata similar in size to *L. humile* and seemingly larger than those of *L. vulgare*.

L. × *neumanii* is a scarce plant in Britain, the BSBI Maps Scheme (www.bsbimaps.org.uk/atlas) giving 30 hectad records, with concentrations in south-west Scotland, north-west England, north Wales, Hampshire and East Anglia. If confirmed, those at Marshside would be the first for v.c.59 (D.P. Earl *in litt*., 2013).

Between 2010 and 2012, there was little change in *Limonium* populations at Marshside, the count for *L. vulgare* (57 plants) being slightly lower than in 2010, while *L. humile* increased by only two individuals to 14. However, the number of putative hybrids increased from two to seven (Table 1). Boorman (1967) noted that hybrids may occur wherever *L. vulgare* and *L. humile* grow together. Their frequency is variable but populations with as many as 25% hybrids have been recorded. The proportion of putative hybrids at Marshside was 9% in 2012.

The distribution of *Limonium* taxa on the saltmarsh in 2010 and 2012 remained similar to that in 2008, with some indication of spread south and west into newly formed habitat (Figs. 2, 3, p. 10), this marsh being in a phase of rapid accretion (Newton *et al*., 2007; Smith & Greenwood, 2009). It is evident from the GPS coordinates that some individuals were recorded in all years, *L. vulgare* plants having grown considerably during the four-year period to up to 1m in diameter. This species often forms large patches, sometimes several metres across (Boorman, 1967). Nine small flowering plants of *L. vulgare* with a diameter of ≤0.3m were found in 2012, these being thought additional to those recorded two years earlier. Therefore, some mortality of older individuals is likely to have occurred between 2010 and 2012. Boorman (1967) noted that *L. vulgare* probably does not flower until its third year. However, the chances of finding non-flowering rosettes at Marshside are extremely low, none being seen during this study. Both the putative hybrid plants found in 2010 were also recorded in flower two years later.

The rapid spread of *L. vulgare* at Marshside contrasts with the picture on the north side of the Ribble Estuary. As reported by Smith &

Greenwood (2009), a single individual was present at Lytham, Lancashire, for about 25 years before any population increase took place. This was probably due to the fact that the plant arose from a single propagule and, being self-incompatible (Boorman, 1967; Stace, 2010), could only spread vegetatively. At Marshside, however, it seems likely that several propagules arrived at around the same time, permitting both vegetative and sexual reproduction. As *L. humile* is self-compatible, sexual reproduction and spread could occur soon after arrival on both banks of the estuary.

As the area of ungrazed saltmarsh at Marshside is continuing to expand, the habitat for *Limonium* is increasing and it will be interesting to follow the fortunes of these populations in future years.

Acknowledgements:
We are grateful to Richard Burkmar and Ben Deed of Merseyside BioBank for producing the distribution maps and to Eric Greenwood and Mike Wilcox for helpful suggestions to improve the manuscript.

References:

BOORMAN, L.A. (1967). '*Limonium vulgare* Mill. and *L. humile* Mill'. *Journal of Ecology*, **55**: 221-232.

NEWTON, M., LYMBERY, G. & WISSE, P. (2007). *Report on the evolution of salt marsh on the Sefton Coast*. Sefton Borough Council Technical Services, Bootle.

RODWELL, J.S. (2000). *British plant communities*. Vol. 5.: *Maritime communities and vegetation of open habitats*. Cambridge University Press, Cambridge.

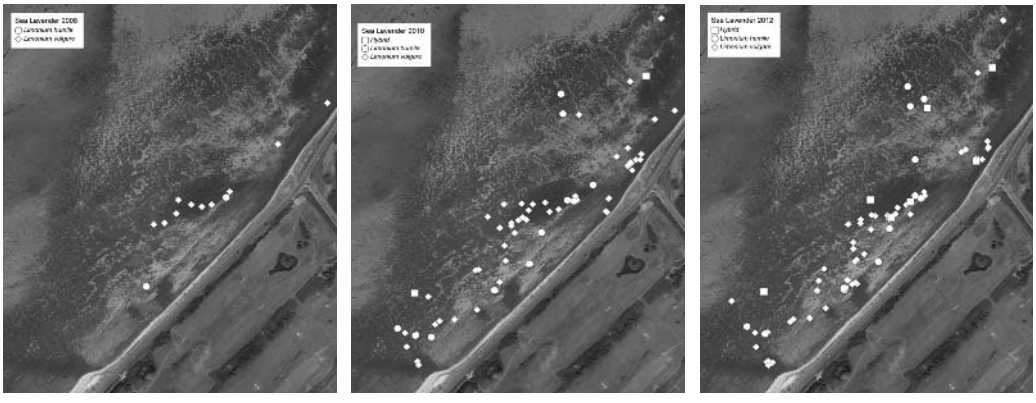
SMITH, P.H. & GREENWOOD, E.F. (2009). 'Colonisation of the Ribble Estuary by Sea-lavenders'. *BSBI News*, **111**: 15-20.

STACE, C.A. (1975). *Hybridisation and the flora of the British Isles*. Academic Press, London.

STACE, C.A. (2010). *New flora of the British Isles*. 3rd edition. Cambridge University Press, Cambridge.

Table 1. Numbers of *Limonium* plants at Marshside in 2008, 2010 and 2012

Taxon	English name	2008	2010	2012
Limonium vulgare ( )	Common Sea-lavender	10	61	57
L. humile (¡)	Lax-flowered Sea-lavender	3	12	14
L. ×*neumanii* (¤)	Hybrid Sea-lavender		2	7



Figs 1 (l), 2 (c), 3 (r). Distribution of Sea-lavenders at Marshside, north Merseyside (v.c.59) in August 2008, 2010 & 2012 respectively.

A lost landscape

CLIVE A. STACE, *'Cringlee', Claybrooke Road, Ullesthorpe, Leics., LE17 5AB*; (cstace@btinternet.com)

When, in 1974, I moved to Ullesthorpe, a village in south-western Leicestershire, the commonest roadside tree was elm, and many back-roads around here were tree-lined leafy lanes, the only two really common trees being elm and ash. Today all the elm trees have long gone, mostly killed during the drought years of the 1970s, which coincided with the peak of Dutch Elm Disease here. Now, there are only isolated ash trees in front of open fields, oak being quite scarce in this part of the county. I counted the rings on many felled trees. A well-grown mature specimen was often about 120 years old, some up to 150 years old, a giant specimen by Claybrooke Church being the oldest, at about 180 years.

As every field botanist knows, identifying elms is a huge problem. In this note, I want to ignore the arguments as to whether the hedgerow elms are species, varieties or hybrids, and whether they are natives of England or were introduced from the Continent. Whatever the answers, there are many different sorts (taxa). Certain parts of the country are much richer in genotypes than others, and the East Midlands are a hot-spot. We can use the present tense, because these genotypes are still present in the hedgerows, and today often constitute a major part of the hedges, although I do not know a single even half-grown tree within ten miles of Ullesthorpe. As soon as the brushwood grows to any height, where it is allowed to in this hunting county of traditionally managed hedgerows and intensive agriculture, it succumbs to the fungus.

Most of these taxa are characterised by different shapes of tree outline, allowing identification from a distance. In 1976, Arthur Chater and I persuaded Ronald Melville, the rose and elm expert from Kew, to accompany us on a tour of south Leicestershire to demonstrate to us the huge variety of elms. This turned out to be a reconnoitre for a very well-attended BSBI trip the following year, which Melville also led (Fig. 6).

Fig. 6. Ronald Melville (second from left) demonstrating elm characters to Mary Briggs, Richard Libbey and (obscured) Guy Messenger in 1977. The same four people are in Fig. 4.

The well-known *Ulmus glabra* (Wych Elm) (Fig. 2) and *U. procera* (English Elm) (Fig. 1), with their very distinctive shapes, the latter very familiar in Constable paintings, were both common here.

Fig. 1. *Ulmus procera*

Fig. 2. *Ulmus glabra*

Also common were two quite different shapes. The trunk of *U. coritana* (Coritanian Elm) (Fig. 3) is branched from low down, and the separate main branches are densely clothed with epicormic growth. It was named by Melville in 1949 after a local tribe of Ancient Britons, the Coritani, and the type specimen came from a tree in a copse on the main road from Lutterworth to Leicester, about two miles north of the former. When we visited in 1976, it had already gone, but very typical specimens were found not far away.

Fig. 3. *Ulmus coritana*

The tall slender shape of *U. plotii* (Plot's Elm) (Fig. 4) is probably the most distinctive in the genus, quite unlike any other elm. It was described by Druce from Banbury, Oxfordshire, in 1911. When we were examining some in Leicestershire in 1976 we were approached by the farmer, who said he had settled in the region only about ten years previously, and the strange shapes (to him weakly or even diseased) of the elms had intrigued him at once. Plot's Elm is characteristic of south-eastern Leicestershire, rather than the south-west. Unfortunately both it and Coritanian Elm proved to be among the genotypes most susceptible to Dutch Elm Disease. Plot's Elm, and perhaps Coritanian Elm too, are apparently endemic to Britain.

Fig. 4. *Ulmus plotii*

As well as the above four taxa, and others such as *U. carpinifolia* (Smooth-leaved Elm) in addition, all of which Melville recognised as species, there are many intermediate taxa which Melville identified as hybrids. As implied above, whether these are really hybrids, or intermediates linking a single taxon, is a matter of opinion, but either way

they are recognisable with practice, and were so even after a single day under Melville's tutelage. Many trees, representing a wide range of south Leicestershire *Ulmus* taxa, were collected by me in flower and leaf, and photographed in winter and summer, by returning to the same marked tree, and the specimens and photographs are preserved in the University of Leicester herbarium, bearing Melville's determinations.

Another elm described from Leicestershire (the type locality is Launde, in the south-east of the county) is *U. elegantissima* Horw. (Fig. 5), described by A.R. Horwood in the 1933 *Flora of Leicestershire and Rutland*, which was co-authored by him, and called 'The Midland Elm'. Since it was regarded as common in that area, and in neighbouring Rutland and northern Northamptonshire, it is odd that exactly which elm was intended is still obscure. Melville interpreted it as the hybrid *U. glabra* × *U. plotii*, which is common in the area and can certainly be a very elegant tree, with pendulous branchlets.

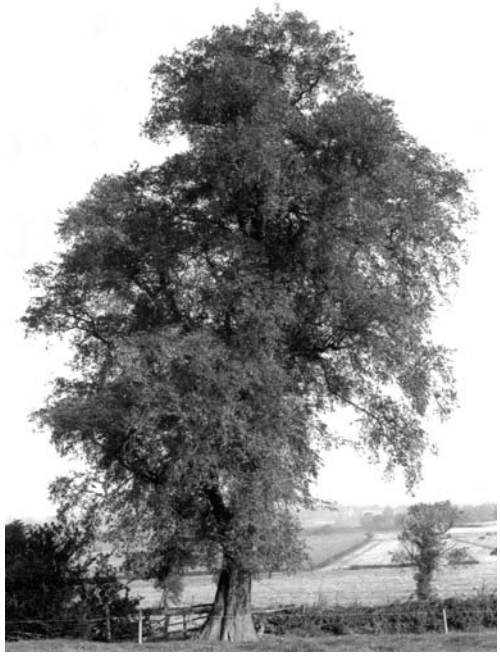


Fig. 5. R. Melville determined this as *Ulmus glabra* × *U. plotii*, which is his interpretation of *U. elegantissima* Horw.

The sad loss of our elm trees has for ever changed the south Leicestershire landscape, now much more open and less interesting. If Ash Dieback takes a similar toll, the landscape will resemble that in parts of East Anglia. As a memento of former times, five distinctive Leicestershire elms are presented here, together with a photograph taken on the BSBI elm meeting on 20th August 1977.

Botanical riches at the RSPB's Minsmere Nature Reserve, East Suffolk

C. JAMES CADBURY, RSPB, The Lodge, Sandy, Bedfordshire, SG19 2DL

Minsmere, on the Suffolk coast, has long been held in high esteem for its wetland and heathland breeding birds and an impressive tally of visiting ones. Less publicised but of equal conservation importance is the biodiversity, with a wide range of scarce invertebrates and plants. This short paper describes some of the more notable vascular plants that have been recorded recently on the reserve.

In recent decades the coastline of Suffolk, including Minsmere, has been subject to some marked changes as the result of erosion by the sea. Storm surges and sea level rise have combined to alter the beach profile and the dune ridge is increasingly vulnerable to breaching. Saline inundation will have a serious impact on the freshwater marshes inland of the dunes. Disturbance and re-profiling of Minsmere's beach has benefited *Crambe maritima* (Sea Kale) but has eradicated several colonies of *Lathyrus japonicus* (Sea Pea). It is believed that *Corynephorus canescens* (Grey Hair-grass) was introduced to Minsmere when the beach ridge was strengthened following the 1953 flooding. At least four sub-populations of this attractive, rare grass became established on the landward slope of the dunes. These were apparently wiped out after the sea breached the ridge in November 2006 and again in November 2007.

However, a small population of 92 tussocks appeared in 2012, where there had been over a thousand tussocks in 2004.

Banks within the reedbeds continue to support thriving populations of *Althaea officinalis* (Marsh Mallow) and the tall *Sonchus palustris* (Marsh Sowthistle). A startling discovery in 2008 was a small colony of *Pyrola rotundifolia* (Round-leaved Wintergreen) close to the Island Mere Hide. There were 12 inflorescences in 2012. The last Suffolk record was in 1906, probably at Ashen Spring, Theberton, less than 5 km away (Sandford & Fisk, 2010).

Potamogeton alpinus (Red Pondweed) has a mainly northern distribution in Britain and is rare in East Anglia. In 1993 the author discovered it growing plentifully in a ditch on the reserve near East Bridge. It was still frequent in 2003 and had spread to an adjoining ditch. By 2012, however, the ditches had become overgrown and there was no sign of the pondweed. In the course of the construction of a new sluice, the Environment Agency opened up the margin of the North Marsh reedbed, adjacent to the main track from the Centre to the beach. The resulting shallow pools were colonised not only by *Hydrocharis morsus-ranae* (Frogbit) in abundance but also Bladderwort, which flowered in profusion in 2012. Though a bladderwort had been recorded previously at Minsmere, its specific identity had not been determined until the flowering confirmed it as being *Utricularia australis*. The only recent previous Suffolk record was in 1994 at Lound Lakes (Sandford & Fisk, 2010).

Most unexpected was the appearance of *Erodium maritimum* (Sea Stork's-bill), which was discovered by Stephen Massey in 2005, growing on sandy ground around a pond near the Reserve's Centre. It was recorded independently by the author in 2011 and by 2012 it had spread and was flourishing. Reference to the *New atlas* (Preston *et al.*, 1992) shows that the species is mainly restricted in Britain to the coasts of Wales and the South-west Peninsula. It was not supposed to occur in East Anglia. It is tempting to suggest that seed found its way to Minsmere on a birdwatcher's footwear. *Crassula tillaea* (Mossy Stonecrop) was growing on the same sparsely-vegetated ground.

Filago lutescens (Red-tipped Cudweed) is both Rare and Endangered in Britain. It has been carefully monitored and managed at Minsmere, where it grows within a Rabbit-proof exclosure that is rotovated in autumn every two years. The population fluctuates but an encouraging response to this management was a count of 1206 plants by Mel Kemp in 2012. *Silene gallica* (Small-flowered Catchfly) is another Endanged species. Seeds from Covehithe were sown within the exclosure in February 2009. In 2012 there were 12 plants.

Efforts have been made at Minsmere to restore nutrient-poor grassy heathland. Ploughing on former arable resulted in a wonderful display of *Glebionis segetum* (Corn Marigold) in the 1990s, beside the road from Westleton. Mark Gurney found *Apera interrupta* (Dense Silky-bent) frequent in ploughed plots in 2001 but it was much reduced the following year when the sward had become more closed.

The benefits of having threatened plants on reserves is that they can be saved from unnecessary destruction, the habitat can be maintained or enhanced, and populations can be kept under surveillance.

Acknowledgment:
I am grateful to the RSPB staff at Minsmere for providing me with certain dates and other information.

References:

PRESTON, C.D., PEARMAN, D.A. AND DINES, T.D. (eds.) (1992). *New atlas of the British and Irish flora*. Oxford University Press, Oxford.

SANDFORD, M. AND FISK, R. (2010) *A flora of Suffolk*. Privately publ,ished, Ipswich.

Synchronised variation in fruit production in *Fraxinus excelsior* (Ash)

T.H. BLACKSTOCK, *Eirianallt, Glanrafon, Llangoed, Anglesey, LL58 8PG*; (tim.blackstock@hotmail.co.uk)

Marked variation in the annual seed crop is a well-known feature of *Fraxinus excelsior* and is often mentioned in the botanical literature. Seed output varies from bumper or mast years to those with minimal or virtually no seed production, with intermediate levels in other years. Such variability has been reported from a number of study sites but there seems to have been much less recording of reproductive output in Ash across the countryside at large. The main purpose of this note is to report recent observations of widespread year-to-year differences in Ash fruiting behaviour across parts of southern Britain, including years when very little seed was set.

When assessing fruit production in *F. excelsior*, it is important to bear in mind that there are different sex forms among trees in the population. Some individuals are bisexual and others are either male or female, as recently illustrated and described in FRAXIGEN (2005). Ash keys may be formed in the inflorescences of females and hermaphrodites, but a proportion of the trees are male so that in any one year only a part of the population can be expected to bear fruit.

By late summer and through the autumn to the following spring, fruiting Ash trees can be readily recognised, especially those with a heavy crop in large bunches of keys. My records are largely from north-west Wales but are supplemented by observations made during train and car journeys to other parts of Britain.

From 1988 to 2004, I made records of flowering behaviour in a small stand of Ash in Anglesey. The sex of individual trees was found to remain stable, and in 1995 it was noticed that very little fruit had formed on female and bisexual trees. Observations elsewhere that year indicated fruiting failure among Ash was widespread in other parts of north-west Wales.

The next year when the Anglesey Ash fruited very poorly was 2005. More extensive observations in that year suggested widespread fruiting failure in Ash across other parts of southern Britain, with very few trees bearing any fruit over the whole of Wales, as also noted by Chater (2010). Elsewhere, minimal fruit was evident on Ash trees observed on train and car journeys in the west Midlands and Sussex, when thousands of trees were seen. Likewise in 2007, there was a similar lack of fruit among Ash across Wales, and there appeared to be a comparable dearth noted on visits to Dorset and Gloucestershire, and also southern Scotland. Occasional fruiting trees were seen in these years, notably in suburban settings where Ash is often planted as an ornamental feature.

During the period 2005-2012, heavy fruit production was noted in Wales in 2006, 2008 and 2010, while it was noticeably more moderate in 2009 and 2011. Similar observations were made elsewhere in parts of west and south England. In 2012, it was evident that Ash fruiting was at an intermediate level in north Wales but there was a much heavier Ash fruit crop in parts of the Midlands, the Welsh Marches, Somerset, Lancashire and Cumbria.

In contrast to these broad-scale observations, detailed quantification of fruiting behaviour in *F. excelsior* has been made at study sites in Europe. Seed consumption by larvae of the moth *Pseudargyrotoza conwagana* (a specialist on Ash and also Privet) has often been observed. Wardle (1959, 1961), for instance, reported 9-66% seed mortality due to larval predation in samples from Cambridgeshire, Norfolk and Wiltshire. At Lathkilldale NNR in Derbyshire, Gardner (1977) collected Ash fruit in traps during 1966-1971 and found that seed production varied from <1 to 998 seeds per m^2. He suggested that fruiting might be effectively biennial, with good years followed by bad years. At the same site,

Flowerdew & Gardner (1978) found that Ash seed was an important component of the food intake of Bank Voles. A longer investigation was undertaken of a population of *F. excelsior* on the island of Åsmansboda in Sweden over the period 1980-1993, and the findings are summarised in Tapper (1996). He again found considerable inter-year variation in fruit production and this appeared to be related to the timing of leafing in the preceding year, which itself was temperature dependent, rather than to fruiting performance in the previous year. It was suggested that this environmental cue might synchronise population seed output, and he also found that the proportion of seed that germinated in the field increased with total seed crop, so that predator satiation may take place in mast years. In FRAXIGEN (2005), flowering intensity is said to be mainly determined by summer temperatures two years preceding flowering. In such an abundant species as Ash, it also seems likely that seed predation levels are affected by synchronised reduction in food resources during years of negligible fruiting.

The significance of annual fluctuation in seed production as the crop passes through the predation gauntlet is dependent on synchronisation among mature individuals. Such synchronisation appears to take place over wide areas in southern Britain, but I have been unable to find much relevant published information. Wardle (1961) mentioned that in East Anglia *F. excelsior* sets abundant seed in some years, while in others seed formation is uneven or absent. Other recorders may well have further information on regional fruiting performance in British Ash and I would be interested to learn more or be corrected by experience from elsewhere.

References:

CHATER, A.O. (2010). *Flora of Cardiganshire*. Privately published, Aberystwyth.

FLOWERDEW, J.R. & GARDNER, G. (1978). 'Small rodent populations and food supply in a Derbyshire ashwood.' *Journal of Animal Ecology*, **47**: 725-740.

FRAXIGEN (2005). *Ash species in Europe: biological characteristics and practical guidelines for sustainable use.* Oxford Forestry Institute, University of Oxford.

GARDNER, G. (1977). 'The reproductive capacity of *Fraxinus excelsior* on the Derbyshire limestone.' *Journal of Ecology*, **65**: 107-118.

TAPPER, P.-G. (1996). 'Long-term patterns of mast fruiting in *Fraxinus excelsior*.' *Ecology*, **77**: 2567-2572.

WARDLE, P. (1959). 'The regeneration of *Fraxinus excelsior* in woods with a field layer of *Mercurialis perennis*.' *Journal of Ecology*, **47**: 483-497.

WARDLE, P. (1961). 'Biological Flora of the British Isles: *Fraxinus excelsior* L.' *Journal of Ecology*, **49**: 739-751.

Those *Myriophyllum* turions: an embarrassing blunder

JOHN H. BRATTON, *18 New Street, Menai Bridge, Anglesey, LL59 5HN*; (jhnbratton@yahoo.co.uk)

The article on turions of *Myriophyllum spicatum* (Spiked Water-milfoil) in the last *BSBI News* (Bratton, 2013) brought a swift response from Chris Preston, asking how sure I was of the identity of the plant. Well, I was sure, but it turns out I was wrong to be so. He has re-determined the turion-bearing plant as *M. verticillatum* (Whorled Water-milfoil). I shall take note of my own article title in future.

I apologise for misleading *BSBI News* readers, and in particular to Nick Stewart, who recorded *M. verticillatum* in the Left-hand Main Drain in 2008. The credit for re-finding it on Anglesey after a gap of over a century belongs to him. I also thank Chris Preston for pointing out my error and supplying the following paragraph of extra detail.

> "Plants previously reported as turion-bearing *Myriophyllum spicatum* in Europe are now regarded as a separate species, *M. sibiricum* Komarov (*M. exalbescens* Fernald), which appears to have a

circumpolar Boreal distribution. It is treated in the excellent account of the genus in *Flora Nordica* (Ericsson, 2010), which is illustrated by colour photographs of vegetative shoots and turions. *M. sibiricum* has an easterly distribution in the Nordic countries, and is rare and local in Norway, suggesting that it is not very likely to be found in Britain or Ireland. Ericsson describes its turions as rather loose and flexible, broadest at the base or in the middle and more or less pointed at the apex. As the photographs from Anglesey show, *M. verticillatum* has turions which are dense and stiff, broadest at the apex and blunt-ended".

References:

BRATTON, J.H. (2013). 'Beware the turions of *Myriophyllum*'. *BSBI News*, **122**: 18.

ERICSSON, S. (2010). 'Haloragaceae'. in: Jonsell, B. & Karlsson, T. (eds.). *Flora Nordica*, **6**: 19-156. Swedish Museum of Natural History, Stockholm.

The vascular plant Red Data List for Great Britain: a summary of amendments in years 6 and 7 (2011-12) of the annual amendments process

SIMON J. LEACH, *Natural England, Riverside Chambers, Castle Street, Taunton, Somerset TA1 4AP*; (simon.j.leach@naturalengland.org.uk);

KEVIN J. WALKER, *BSBI Plant Unit, c/o 97 Dragon Parade, Harrogate, North Yorkshire HG1 5DG*; (kevinwalker@bsbi.org.uk)

Following publication of year 1, year 2 and years 3-5 amendments (Leach, 2007, 2010; Leach & Walker, 2011), the Species Status Assessment Group (SSAG) for vascular plants has now agreed a number of further changes to the *Red Data List* covering years 6 and 7 of the annual amendments process (2011-2012). As usual, these are being submitted to JNCC to be incorporated into the master list on the JNCC website; a copy of the revised *Red Data List*, including the Waiting List, will also shortly be available to download from the BSBI website. A summary of the main changes is given below.

The amendments fall into three categories: (a) nomenclatural changes, (b) amendments and additions to the Main List, and (c) amendments and additions to the Waiting List. It should be noted that new or amended threat statuses have been determined in accordance with the IUCN threat criteria used to compile the original *Red Data List* (IUCN, 2001, 2003). In the following account, threat status categories are abbreviated as follows: EX: extinct, CR: critically endangered, EN: endangered, VU: vulnerable, NT: near threatened, DD: data deficient, LC: least concern (= not threatened). For definitions, see Cheffings & Farrell (2005).

Main List

There are 149 changes to the Main List: 131 taxa (all *Hieracium* spp.) are given revised threat statuses, 15 are added for the first time, and there are three name changes. In alphabetical order, these amendments and additions are as follows:

Bolboschoenus laticarpus (a Club-rush), recognised as a distinct species in the recent taxonomic revision of European *Bolboschoenus* (Hroudová *et al.*, 2007), is now known to occur in Great Britain (GB). It has been recorded from a wide scatter of (mainly inland) localities in England: in Somerset, for example, it seems that this may be a frequent species of grazing marsh ditches on the Somerset Levels and Moors (Crouch, 2011). Much work still needs to be done to flesh out its overall distribution in GB, but we are confident that it is not under any threat, and so it is now added to the Main List as LC.

Carex cespitosa (Small Tufted-sedge), a sedge morphologically close to *Carex nigra* and *C. elata*, has recently been discovered at a single site in Hertfordshire (James *et al.*, 2012). It is apparently threatened across much of the rest of its range in western Europe, and "the Spanish and British populations constitute the absolute western limit of [its global] distribution... It appears vital to include the single identified

British population in the National Red List" (James *et al.*, 2012). Previously not listed, this sedge is now added to the Main List as CR.

Dactylorhiza incarnata ssp. *coccinea* (an Early Marsh-orchid), previously on the Waiting List, is now added to the Main List as LC. While not believed to be under threat, it should be noted that within GB it is Nationally Scarce. There is much less certainty about the current status of *D. incarnata* ssp. *gemmata*. Previously not listed, for the time being it is added to the Main List as DD, as further work is needed to ascertain its correct threat status.

Equisetum ramosissimum (Branched Horsetail), previously on the Waiting List (Leach & Walker, 2011), is now felt to be an intractable species with regard to native/alien status, *i.e.* a species for which there will always be doubt about its true status in GB. Taking a precautionary approach, the SSAG has decided that it is probably best categorised as 'Native or Alien' and, as such, it is now added to the Main List as VU.

Fumaria reuteri (Martin's Ramping-fumitory), previously on the Waiting List, is another problematic taxon with regard to status. It is the only one of the *ramping*-fumitories (*Fumaria*, Sect. *Capreolatae*) to be viewed as a non-native in GB, and the only 'arable' fumitory not currently listed as either a native or an archaeophyte. The relatively late date of discovery (1904) certainly suggests a neophyte (Pearman, 2007), but we do wonder whether its extreme rarity, and the ease with which such 'difficult' taxa can be overlooked, may have contributed to this. The widespread *F. muralis* ssp. *boraei* (Common Ramping-fumitory) also has a remarkably late first date in the wild (1860), yet this taxon is accepted as a native, partly, no doubt, on account of the fact that it "has a niche not only in arable fields, but also in scrub-edge, hedges and vegetated cliffs" (Pearman, 2007). *F. reuteri* is restricted to disturbed/cultivated ground, but given the critical nature of the genus we think the possibility of it being an archaeophyte cannot be excluded, and that it should therefore now be re-categorised as 'Neophyte or Archaeophyte'. While it is undeniably Nationally Rare, it is not thought to be under threat nationally (in fact there have been several new records of it in recent years), and so it is added to the Main List as LC.

Heracleum sphondylium ssp. *flavescens* (a Hogweed) (previously Waiting List) is added to the Main List as DD. Stace (2010) notes this taxon as being 'RRR' (*i.e.* recorded in 15 or fewer 10km squares in the British Isles since 1987) and apparently restricted to NE Norfolk where "its continued presence needs investigation". It would clearly merit further work, to clarify both its native/alien status and its current distribution.

Hieracium species. The Main List has been updated to bring it into line with the threat assessments and nomenclature given in McCosh & Rich (2011). In summary, threat statuses are amended for a total of 131 species. 47 taxa previously listed as LC have now been reassessed as near-threatened, threatened or data deficient, and are amended as follows: 27 as VU, six as EN, one as EN?, nine as NT and four as DD. 61 taxa assessed as VU are also amended: 37 are given a higher threat status – 20 as EN, 15 as CR and two as EX – while 23 are now listed as DD and one as NT. Two species previously listed as EN are amended, one to VU, the other to CR, while one species thought to be possibly extinct in the wild is now *known* to be extinct and so is amended to EX. Conversely, two species previously listed as EX? are known to be still extant, one now amended to VU, the other to EN. Two species previously listed as CR are amended to EN, while three NT taxa are also amended, one to VU, one to CR and the third to LC. Lastly, 13 DD species have had their threat status amended, one to NT, six to VU, three to EN and three to CR. In addition there have been three nomenclatural changes: plants previously referred to *H. carpathicum* have been determined as a distinct taxon, named *H. perthense* (Perth Hawkweed); *H. kintyr-icum* (Kintyre Hawkweed) is regarded by Rich & McCosh (2010) as falling within the range of variation of *H. vinifolium* (Claret-leaved hawkweed), and so no longer has a separate entry on the Main List; and *H. neomarginatum* (Spear-leaved Hawkweed) is given by McCosh & Rich (2011) as a new name for the illegitimate *H. marginatum.* For full details of these changes and for current threat statuses of all GB

hawkweeds, readers should consult McCosh & Rich (2011) or refer to the revised *Red Data List* on the BSBI website.

Lemna turionifera (Red Duckweed), previously on the Waiting List, has been the subject of much debate as regards its status in GB. We understand that the weight of opinion is now leaning towards it being viewed as a new (or previously overlooked) native rather than as an alien. Adopting a relatively conservative status assessment of 'Native or Alien' still requires it to be added to the Main List. It does, however, appear to be spreading (or much better recorded), and is certainly not under any threat. As such, it is added to the Main List as LC.

Melampyrum arvense (Field Cow-wheat) was assessed by Pearman (2007) as an alien but, significantly, he added in parentheses "neophyte, though *possible archaeophyte*" (our italics). The SSAG now considers it best to categorise this species as a 'Neophyte or Archaeophyte', and it is therefore removed from the Waiting List and added to the Main List as EN on account of the severity of its decline, restricted area of occupancy and small number of extant populations.

Petrorhagia prolifera (Proliferous Pink), previously on the Waiting List, is now viewed as an intractable taxon with regard to native/alien status. Akeroyd & Bennett (1995) argued persuasively for it being a native, while Pearman (2007) felt it more likely that it is a recent introduction (first date in wild uncertain, but probably later than 1840, and in ruderal habitats). Stace (2010) hedges his bets, listing it as "probably native". Adopting a precautionary approach, we have decided to re-categorise this species as 'Native or Alien' and, as such, it is now added to the Main List as EN.

Taraxacum pankurstianum is a newly described endemic dandelion restricted to St Kilda (Richards & Ferguson-Smyth, 2012). It is added to the Main List as VU.

Taraxacum limbatum (Bordered Dandelion) has recently been recognised in western Scotland. It is known to occur widely around the Baltic coast and in Denmark and Norway, often in similar habitats to those in which it is found in Scotland. Currently reported from just three localities, one in each of three vice-counties, "it must be considered rare and possibly threatened in the British Isles" (Ferguson-Smyth & Richards, 2011). Until its distribution in GB is better understood, it is added to the Main List as DD.

Tripleurospermum maritimum sspp. *nigriceps* and *vinicaule* (previously Waiting List) are described in Sell & Murrell (2006) and accepted by Stace (2010), ssp. *nigriceps* mainly occurring in northern Scotland, including Shetland and Orkney, ssp. *vinicaule* chiefly in southern England. Despite their relatively restricted distributions, neither is considered to be under any threat and so they are now added to the Main List as LC.

Vulpia unilateralis (Mat-grass Fescue) is now viewed, like *Equisetum ramosissimum* and *Petrorhagia prolifera,* as an intractable taxon with regard to native/alien status. Preston, Pearman & Dines (2002) assessed it as a neophyte, although Stace (1961) argued for it being considered native, and almost fifty years later was still inclined to describe it as "possibly native" (Stace, 2010). Adopting a precautionary approach, we have decided to re-categorise this species as 'Native or Alien' and, as such, it is now removed from the Waiting List and added to the Main List as LC. It is undoubtedly Nationally Scarce, but on present evidence we can see no reason for regarding it as threatened.

Waiting List

The Waiting List remains an important repository for taxa where a proper threat assessment is presently hampered by a lack of distributional data, or where taxonomic issues or questions of native/alien status are yet to be resolved. The list is therefore helpful in highlighting those taxa for which more work is needed to determine whether they should be added to the Main List or removed to the Parking List[1]. Changes to the Waiting List are as follows:

[1]The 'Parking List' comprises taxa considered for inclusion on the Main List or Waiting List by Cheffings & Farrell (2005), but rejected either on taxonomic grounds (*e.g. Athyrium flexile*, *Epipactis youngiana*) or because they are now generally assumed to be neophytes (*e.g. Gnaphalium luteoalbum*, *Spergularia bocconei*).

As detailed above, ten Waiting List taxa are now added to the Main List: *Dactylorhiza incarnata* ssp. *coccinea*, *Equisetum ramosissimum*, *Fumaria reuteri*, *Heracleum sphondylium* ssp. *flavescens*, *Lemna turionifera*, *Melampyrum arvense*, *Petrorhagia prolifera*, *Tripleurospermum maritimum* sspp. *nigriceps* and *vinicaule*, and *Vulpia unilateralis.* We have reconsidered a number of other Waiting List taxa, and our view is that four species can be removed to the Parking List on the grounds that all available evidence points to them being neophytes: *Euphorbia villosa* (Hairy Spurge), *Malva pseudolavatera* (= *Lavatera cretica*) (Smaller Tree-mallow), *Limosella australis* (Welsh Mudwort) and *Symphytum tuberosum* (Tuberous Comfrey). All except *L. australis* were assessed as neophytes by Pearman (2007). The status of *L. australis* was assessed as 'Native or Alien' – and it is give as 'native' in Stace (2010) – but a recent assessment by Jones (2011) convinces us that it is almost certainly a neophyte.

Taraxacum subericinum is added to the Waiting List, following its discovery in N. Devon. Its European distribution includes the Netherlands, Belgium, Denmark, Poland and the Czech Republic. As reported by Rich & Richards (2011), despite the GB records being highly disjunct from its main stronghold in eastern Europe, "its occurrence in 'good' habitat in Devon does not make it an immediately apparent introduction."

Acknowledgements:
The present note is written on behalf of the vascular plants Species Status Assessment Group, coordinated by the BSBI and including representatives from the BSBI, Countryside Council for Wales, Natural England, Natural History Museum, Plantlife, Royal Botanic Garden Edinburgh and Scottish Natural Heritage. Our thanks go to Lynne Farrell, Andy Jones, Iain Macdonald, John Martin, David Pearman, Fred Rumsey and Ian Taylor for comments on the draft.

References:

AKEROYD, J.R. & BECKETT, G. (1995). '*Petrorhagia prolifera* (L.) P.W. Ball & Heywood (Caryophyllaceae), an overlooked native species in eastern England'. *Watsonia*, **20**: 405-407.

CHEFFINGS, C.M., FARRELL, L. (eds.), DINES, T.D., JONES, R.A., LEACH, S.J., MCKEAN, D.R., PEARMAN, D.A., PRESTON, C.D., RUMSEY, F.J. & TAYLOR, I. (2005). 'The Vascular Plant Red Data List for Great Britain'. *Species Status*, **7**: 1-116. Joint Nature Conservation Committee, Peterborough.

CROUCH, H. (2011). 'Plant notes: *Bolboschoenus laticarpus*'. *Somerset Rare Plants Group Newsletter*, **12**: 10-11.

FERGUSON-SMYTH, C. & RICHARDS, A.J. (2011). *Taraxacum limbatum* H. Dahlstedt (Bordered Dandelion), new to the British Isles. *BSBI News*, **116**: 38-39.

HROUDOVÁ, Z., ZÁKRAVSKÝ, P., DUCHÁČEK, M. & MARHOLD, K. (2007). 'Taxonomy, distribution and ecology of *Bolboschoenus* in Europe'. *Annales Botanici Fennici*, **44:** 81-102.

IUCN (2001). *IUCN Red List categories.* IUCN Species Survival Commission. As approved by the 40th Meeting of the IUCN Council, Gland, Switzerland.

IUCN (2003). *Guidelines for using the IUCN Red List categories and criteria.* Version 3.1. IUCN Species Survival Commission, Gland, Switzerland and Cambridge, UK.

JAMES, T.J., JIMÉNEZ-MEJÍAS, P. & PORTER, M.S. (2012). 'The occurrence in Britain of *Carex cespitosa*, a Eurasian sedge rare in western Europe'. *New Journal of Botany*, **2**: 20-25.

JONES, R.A. (2011). 'Molecular genetics and the need for historical and field data: three case studies from the Countryside Council for Wales' research into scarce and declining lowland plants'. In: BLACKSTOCK, T.H., HOWE, E.A., ROTHWELL, J.P., DUIGAN, C.A. & JONES, P.S. (eds.) *Proceedings of a memorial conference for Dr David Paul Stevens, 1958 – 2007, grassland ecologist and conservationist.* CCW Staff Science Report No. 10/03/05. Countryside Council for Wales, Bangor.

LEACH, S.J. (2007). 'The Vascular Plant Red Data List for Great Britain: Year 1 Amendments'. *BSBI News*, **104**: 19-21.

LEACH, S.J. (2010). 'The Vascular Plant Red Data List for Great Britain: Year 2 Amendments'. *BSBI News*, **113**: 43-44.

LEACH, S.J. & WALKER, K.J. (2011). 'Vascular Plant Red Data List for Great Britain: a summary of year 5 amendments, covering years 3, 4 and 5 (2008-10) of the annual amendments process'. *BSBI News*, **116**: 51-56.

MCCOSH, D.J. & RICH, T.C.G. (2011). *Atlas of British and Irish hawkweeds* (Pilosella *L. and* Hieracium *L.*). Botanical Society of the British Isles, London.

PEARMAN, D.A. (2007). ''Far from any house' – assessing the status of doubtfully native species in the flora of the British Isles'. *Watsonia*, **26**: 271-290.

PRESTON, C.D., PEARMAN, D.A. & DINES, T.D. (eds.) (2002). *New atlas of the British and Irish flora.* Oxford University Press, Oxford.

RICH, T.C.G. & MCCOSH, D.J. (2010). 'Taxonomy and conservation status of *Hieracium vinifolium* (including *H. kintyricum*), Claret-leaved Hawkweed (Asteraceae)'. *Watsonia*, **28**: 151-156.

RICH, T.C.G. & RICHARDS, A.J. (2011). '*Taraxacum subericinum* Hagendijk, Soest & Zevenb. (sect. *Hamata*) new to the British Isles'. *BSBI News*, **117**: 45-46.

RICHARDS, A.J. & FERGUSON-SMYTH, C.C. (2012). '*Taraxacum pankurstianum* (Asteraceae), a new dandelion endemic to St Kilda, Outer Hebrides, Scotland'. *New Journal of Botany*, **2**: 16-19.

SELL, P.D. & MURRELL, G. (2006). *Flora of Great Britain and Ireland*, Vol. 4. Cambridge University Press, Cambridge.

STACE, C.A. (1961). *Nardurus maritimus* (L.) Murb. in Britain. *Proc. BSBI*, **4**: 248-261.

STACE, C.A. (2010). *New flora of the British Isles.* 3rd ed. Cambridge University Press, Cambridge.

Black Poplar (*Populus nigra* ssp. *betulifolia*) in Cumbria

GEOFFREY HALLIDAY, *26 Mowbray Drive, Burton-in-Kendal, Carnforth, Lancs., LA6 1NF*;
F. JEREMY ROBERTS, *Eden Croft, 2 Wetheral Pasture, Carlisle, Cumbria, CA4 8HU*

In their recent article in *BSBI News* on Black Poplar trees at Formby Point, Smith & Lockwood (2012) refer to a comment by Cooper (2006) to the effect that she considers that the tree at Langwathby, Cumberland, v.c.70, in the River Eden valley, to be a hybrid. This tree is one of three in the valley which are listed as *Populus nigra* ssp. *betulifolia* by Halliday (1997). Since then a fourth specimen has been found, also in the Eden valley, but in Westmorland, v.c.69. Fresh material of all four was submitted to Stuart A'Hara for molecular DNA testing in 2011. The results, the subject of a short note in *The Carlisle Naturalist* (Halliday & Roberts, 2012), were conclusive, all proving to be the same male clone 34 as the Formby tree. All exhibited the petiolar gall caused by the woolly aphid *Pemphigus spyrothecae*. These Cumbrian records are the northernmost *authenticated* records in Britain. We are of the opinion that they represent relicts of old plantings, much as do the several records of the male *Salix* ×*ehrhartiana* in the Eden valley.

References:

COOPER, F. (2006). *The Black Poplar: ecology, history and conservation*. Windgather Press, Macclesfield.

HALLIDAY, G. (1997). *A flora of Cumbria.* University of Lancaster, Lancaster.

HALLIDAY, G. & ROBERTS, F.J. (2012). 'Black Poplar (*Populus nigra* subsp. *betulifolia*) in Cumbria'. *The Carlisle Naturalist*, **20**: 6-7.

SMITH, P.H. & LOCKWOOD, P.A. (2012). 'Investigations into a previously unknown population of Black Poplar (*Populus nigra* ssp. *betulifolia*) at Formby Point, Merseyside'. *BSBI News*, **121**: 23-34.

Tilia cordata (Small-leaved Lime) in gill woodland in the Weald of Kent

PHILIP SANSUM, *Strathayre, Carbeth House, Killearn, Glasgow, G63 9QB*; (philip.sansum@googlemail.com)
KATE RYLAND, *6a Northfield Cottages, Isfield, Uckfield, East Sussex, TN22 5XN*

A small population of apparently native *Tilia cordata* (Small-leaved Lime) was found in semi-natural woodland in Hever, Kent (TQ44) in May 2012. The trees, growing near the heads of two small shallow valleys feeding a larger gill woodland complex, were recorded by KR in the course of field survey work for a revision of the Ancient Woodland Inventory (known as The Weald & Downs Ancient Woodland Survey) in the High Weald AONB. The two sites were very close to each other (within 300m) in *shaws* on the periphery of a more extensive area of ancient semi-natural woodland of NVC communities W10 and W8. In August, PS collected some specimens, which were duly confirmed by Dr C.D. Pigott, to whom we are most grateful. The trees, of which there were fewer than 20 in total, were all coppice stools growing on sloping ground overlying either Ashdown Sands or Wadhurst Clay.

This was an interesting find, firstly because the tree is rare in Kent. Although widespread (if patchily distributed) in ancient woodland habitat in much of lowland England, in this large county (v.c.c. 15 and 16 combined), with its relative abundance of ancient woodland and close proximity to the species' continental centre of distribution, *Tilia cordata* is only known as a native plant in Kent from two or possibly three woods (Philp, 1982, 2010). None of these woods are in the Weald, although there are two or three Wealden records from around the border with Sussex - apparently of non-woodland trees – which might possibly be native. There is also a recent record from Tunbridge Wells Common, but at the time of writing we have been unable to ascertain whether the trees involved are native or not. Pigott (1991) mentions that *Tilia cordata* is sometimes found on old commons. Secondly, we felt these new records were noteworthy in the context of the distribution of the tree in the wider Weald and the Weald's woodland history.

Tilia cordata is rarely found in secondary woodland in Britain (Pigott, 1991). In one of very few publications or reports devoted to lowland gill woodland as an ecological habitat, Patmore & Rose (1997) took its presence in some Weald gills as an indication that such sites might represent primary woodland or "remnants of the original *wildwood*". There are reasons to believe this; for example, some Weald gills seem to have acted as '*refugia*' for several oceanic woodland species now absent elsewhere in lowland southern England and which are presumed to be relics of the mid-Holocene forest vegetation. However, *Tilia cordata* is a sparsely distributed species, even in gills in the Kent and Sussex Weald, and is only rarely a significant constituent of their semi-natural woodland vegetation.

Patmore & Rose only specifically mentioned two Weald gill sites with *Tilia cordata* and attributed its apparent sparsity to under-recording of Lime. If we ignore those records only precise to county or 10km square level and those judged by recorders to be planted trees, then there are 194 BSBI-held records of *Tilia cordata* in the Weald (taking the Weald as those parts of v.c.c. 11,12,13,14,15,16 and 17 which fall within the High Weald, Low Weald and Wealden Greensand National Character Areas, a total area of 503,089 ha). Of these, some bear no indication of status and may therefore also represent planted trees; and of these also, roughly half were made after 1997, when the above-mentioned NCC report on gill woodland was produced (BSBI Distribution Database, 2012). Bearing in mind that many of these records are series of observations of the same populations (and a number are duplicate records) this represents a thin scatter indeed for what is one of the most heavily (and anciently) wooded regions in the

British Isles. The scatter is also uneven, with the greatest local concentration in an area of the Low Weald around the border of West Sussex and Surrey, which seems to be the Weald's headquarters for *Tilia cordata*. 60% of the records are contained within a *c*.8000ha area west of Crawley, which represents less than 2% of the Weald's extent. The reasons for this are unclear. It may be significant that this is an area with a concentration of gill woods, yet where the bedrock is Weald Clay. Elsewhere, the greatest numbers of gills are located on the older strata of the High Weald (Ashdown Formation Sandstone, Wadhurst Clay and Tunbridge Wells Sands).

It is probably true that the tree is under-recorded, but this alone seems an inadequate explanation for the distribution of records in the Weald and particularly for their sparseness in the Kentish Weald. There are certainly limitations of access to Weald gill woodlands. The majority lie enclosed amongst fields in private farmland and many are not even crossed by a public footpath, let alone readily-explored via any form of public access, but nevertheless *Tilia cordata* is a very large phanerophyte and the Wealden counties are populous and relatively well-recorded. Perhaps the perception of sparsity is not inaccurate.

Spencer (1990) offered another explanation, suggesting that the history of Anglo-Saxon wood-pasturage in the Weald, coupled with the palatability of seedlings, saplings and basal or coppice shoots of *Tilia* to large herbivores (Pigott, 1991) might be responsible for its "virtual absence" from ancient woodland in this part of England. He cited pollen analytical work by Baker *et al*. (1978) in Epping Forest, where a *Tilia* pollen decline recorded from the first millennium AD, interpreted as linked to Saxon settlement, might have been analogous with events in the vegetation history of the Weald. Waller & Schofield's (2007) more recent pollen studies in the East Sussex High Weald seem to indicate that *Tilia* had been largely eliminated from the woods by the mid-Bronze Age, much earlier than Saxon settlement, although, as the authors of this work point out, their study area around Rye need not be representative of the region in general. However, and interestingly, Waller & Schofield also link the decline of *Tilia* with the effects of transhumant pastoralism on woodland ecology. They hint that late-Holocene changes in vegetation seen in the pollen record, chiefly increases in *Fagus* (Beech) pollen representation, may indicate a more ancient origin for the Wealden transhumance system than the Anglo-Saxon period (of which historians have evidence) and that the chronology of this is consistent with pollen evidence for declining *Tilia* in prehistory. Rackham (2006: 96, 366) also remarks on Lime's avoidance of historically browsed places and its poor powers of re-establishment in woodland once it has been removed. The uneven and non-synchronous loss of Lime from English woods is still not well understood.

In view of the species' general rarity in secondary woodland, the sparsity of *Tilia cordata* in the Weald fits not only with recent pollen analytical data but also with newer interpretations of the settlement history of the Weald. The former seem to indicate that the ancient woodlands of the region have largely arisen post human disturbance and might not possess strong continuity with mid-Holocene forests (although stand-scale palaeoecological evidence for the woodland vegetation history of the interior Weald is lacking). The latter suggest that human impacts on the environment prior to Anglo-Saxon occupation had been much more far-reaching than landscape historians had originally thought (Harris, 2003).

Nevertheless, the hope expressed by Philp (1982) that native populations of Small-leaved Lime still awaited discovery in woods in the Kentish Weald has proved well-founded. The location of these new records conforms to Pigott's (1991) observation that when the plant is found in the Weald it is commonly associated with a small valley which has "escaped intensive silvicultural treatment". Patmore & Rose's (1997) view that Wealden gill woods are rather poorly understood, in spite of their probable international significance for biodi-

versity and their proximity to London, holds true, and is a point reiterated by Burnside *et al*. (2006). These recent finds show how further undiscovered populations in the Weald of Kent remain a prospect and that, if such trees are uncovered, they may well be associated with gill woods, where the topography affords greater potential for the localised persistence of fragments of primary forest vegetation (or at least for very deep temporal continuity of woodland vegetation). The fact that neither new site had previously been designated as 'ancient woodland' also underlines how incomplete our knowledge of the extensive woodland vegetation of the Weald is and the clear value of continued study and survey, particularly of small woods where semi-natural woodland vegetation has often been less affected by estate-level woodland management or commercial forestry.

Acknowledgements:
The Weald & Downs Ancient Woodland Survey and the surveys which led to this note were funded by a partnership of the High Weald AONB Unit, Natural England, The Forestry Commission, The Kent Downs AONB and Sevenoaks District Council. We are very grateful to the owner of the sites for allowing access to the land.

References:

BAKER, C.A., MOXEY, P.A. & OXFORD, P.M. (1978). 'Woodland continuity and change in Epping Forest'. *Field Studies*, **4**: 645-669.

BSBI Distribution Database. Available at: http://bsbidb.org.uk/ [Accessed: October, 2012].

BURNSIDE, N.G., METCALFE, D.J, SMITH, R.F & WAITE, S. (2006). 'Ghyll woodlands of the Weald: characterisation and conservation'. *Biodiversity & Conservation*, **15**: 1319-1338.

HARRIS, R.B. (2003). *The making of the High Weald: informing the High Weald AONB Management Plan, 2004*. Version 2.2. High Weald AONB Joint Advisory Committee, High Weald AONB Unit, Flimwell.

PATMORE, J. M. & ROSE, F. (1997). *Weald Gill Woodlands*. English Nature, Sussex and Surrey Team, Lewes.

PHILP, E.G. (1982). *Atlas of the Kent flora.* Kent Field Club, West Malling.

PHILP, E.G. (2010). *A new atlas of the Kent flora.* Kent Field Club.

PIGOTT, C.D. (1991). 'Biological flora of the British Isles: *Tilia cordata* Miller'. *Journal of Ecology*, **79**: 1147-1207.

SPENCER, J. (1990). 'Indications of antiquity'. *British Wildlife*, **2**: 90-102.

RACKHAM, O. (2006). *Woodlands.* Collins, London.

WALLER, M.P. & SCHOFIELD, J.E. (2007). 'Mid to late Holocene vegetation and land use history in the Weald of south-eastern England: multiple pollen profiles from the Rye area'. *Vegetation History and Archaeobotany*, **16**.

Since writing the above note we have found among unpublished Forestry Commission survey data another, earlier, record of apparently native *Tilia cordata* in a Kentish Wealden wood. The species was recorded in Mopesden Wood by L. Hutcheby in 2000 in a target note to a survey of ancient woodland on the FC estate (Spencer, 2002). The site is in the upper reaches of a gill running through bedrock of the Tunbridge Wells Sand formation (which in this locality is eroded to expose its mudstone beds), near the eastern edge of Bedgebury Forest (TQ73). The vegetation was recorded as NVC community W8.

Reference:

SPENCER, J.W. (2002). *Ancient woodland on the Forestry Commission Estate in England.* Survey Report. Forest Enterprise.

Alchemilla glabra and *Alchemilla wichurae*

MARK LYNES, *Westlands, 21 Akeferry Road, Westwoodside, Doncaster, N. Lincs., DN9 2DX*; (maslyni@gmail.com)

A week-long *Alchemilla* research trip based in Umea, Sweden in late June 2012 – funded by a BSBI small research grant – allowed me to gain valuable field and herbarium-based experience of a wide range of Scandinavian *Alchemilla* species, a number of which are either known already from the UK; have been reported (*Alchemilla murbeckiana*); or species such as *A. baltica* – currently rampaging across Scandinavia and conceivably the world's first invasive *Alchemilla* species – which could yet be found here. I was particularly keen to gain a Scandinavian perspective on several 'problem' UK taxa, foremost of these being *Alchemilla glabra* (Smooth Lady's-mantle) and *Alchemilla wichurae* (Rock Lady's-mantle).

Alchemilla glabra is widespread throughout much of the UK. As its specific epithet implies, it is an essentially glabrous species, yet it is rarely entirely so. It often shows at least a few hairs on the petioles and invariably to some extent on the main veins on the underside of the leaf. There is, however, a significant degree of variation in characters within at least some populations. Field experience and examination of herbarium specimens suggests such variation may be commonest in the north of England and Scotland.

Alchemilla wichurae is far less widespread, such that it was one of the plants chosen for survey under the Threatened Plants Project in 2012. It is characterised by, *inter alia*, the fine connivent teeth on the leaf lobes, and main leaf veins angled at 45°. This feature is often most obviously seen in the two opposite veins lying at right angles either side of the top of the petiole (see Back cover). Small notches or slits are usually apparent between the lobes, giving rise to the Swedish vernacular name of skårdaggkåpa (Cut Dew Hood). Although many populations are entirely typical, others are more problematic, as intimated in *Plant crib 1998* (Walters, in Rich & Jermy,1998).

Examination of the entire collection of *A. glabra* specimens held at the University of Umea herbarium, hailing from across Scandinavia, together with subsequent field experience, revealed this taxon to be far less variable there than appears to be the case in the UK, with some UK plants exhibiting features seemingly at odds with the accepted norm.

Alchemilla wichurae proved to be almost ubiquitous in an arc from the coast at Umea across Lappland and stretching all the way to the Norwegian coast. Only *Alchemilla monticola* (Velvet Lady's-mantle) was commoner. Scandinavian plants typically compared well with those in the UK. However, the perception that some UK populations exhibit seemingly atypical features was reinforced. Confusion with *A. glabra* is not an issue in Scandinavia, which is not always the case with putative UK specimens.

What, if anything, these apparent anomalies mean is currently part of a more wide-ranging research project into UK *Alchemilla* species. To this end I would be very grateful to receive pressed specimens attributed to both *A. glabra* and *A. wichurae*. Those willing are requested to send 2–4 pressed summer rosette leaves, complete with petiole, together with a single inflorescence. Of *A. glabra* I am particularly interested in plants where some at least of the petioles are considered to be particularly hairy. Please include basic collection data of a date and place name, or preferably a 6-figure (or greater) grid reference. Whilst I welcome complete specimens of *A. glabra* from across the UK, please do not collect whole plants of *A wichurae* and please do not collect this species at all in either Teesdale or Yorkshire.

Please send specimens to me at the address above and feel free to contact me using the email address, also above. I look forward to a deluge of specimens!

Acknowledgements:
I am very grateful to the BSBI for its continuing financial support of my research and all round encouragement and to both Stefan Ericsson and Jeremy Roberts for much useful discussion.

Reference:

WALTERS, S.M., in RICH, T.C.G., & JERMY A.C. (1998). *Plant crib 1998*. Botanical Society of the British Isles, London. Pp. 155-157.

Bolboschoenus laticarpus

MICHAEL WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

Bolboschoenus laticarpus is a taxon in Britain which was brought to our attention at a BSBI Exhibition Meeting in 2010 (I am not aware of an English name for this or the three other taxa in Europe: *B. yagara*, *B. planiculmis* and *B. glaucus*). There are those who are working on the distribution of *B. laticarpus* in the UK: Dr. F. Rumsey and R.V. Lansdown. Once I knew about this taxon I went to check plants at an inland site for '*B. maritimus* (Sea Club-rush)' near here and interestingly it turned out to be *B. laticarpus*. I have also determined material from a couple of other sites and used the material to study other characters. It is more or less a species of inland freshwater sites at present (that I am aware of). I started to investigate the anatomical characters but lacked material of all five of the European taxa to compare. Dr. Z. Hroudová worked out the taxonomy of these taxa in a joint paper, using mainly the shape and anatomy of the fruits. (Hroudová *et. al.*, 2007). Dr. Hroudová kindly sent 1-2 specimens of each for study.

It was thought that it would be useful if these taxa could be identified without the fruits, as sometimes they don't appear to produce many. From the limited material (at present) I was able to work out that the five European taxa can easily be split into two groups without using their fruits, two species in one group and three in another: '**Group 1**': *B. laticarpus* and *B. yagara*; '**Group 2**': *B. maritimus*, *B. planiculmis* and *B. glaucus*. This is based on anatomical characters of stems and leaves. Group 1 is quite different from Group 2. Then it would be useful to know if the species within the two groups could be told apart from each other. On limited material, characters found show that the two species in Group 1 can apparently be told apart from each other based on aspects of stem anatomy. The species in Group 2 are more difficult, but *B. maritimus* and *B. planiculmis* are different from *B. glaucus* in one respect and further material of the latter species from Spain (one without and one with fruits) confirmed the appropriate anatomical character. *B. planiculmis* did differ from *B. maritimus* but they are quite similar and more material is needed to firm up the characters studied.

There are not a great deal of anatomical characters in monocots for taxonomy in some ways, but aspects like the presence or absence of aerenchyma, sclerenchyma patterns, cells types and sometimes stomata can be used to help differentiate between taxa. However, from limited material it seems these taxa can possibly be identified if there are no fruits available. Certainly, in the UK, *B. laticarpus* can be told from *B. maritimus* if no fruits are available. It is also more than likely from the anatomical characters seen that *B. laticarpus* could have formed as a species from a hybrid between *B. yagara* and a species in Group 2, most likely *B. maritimus* (or possibly *B. planiculmis*, but not very likely *B. glaucus*), and moreover that it could also be possible that *B. planiculmis* in Group 2, could have arisen from *B. maritimus* × *B. glaucus*, as it was somewhat intermediate from the specimens that were examined.

In order to see if any of the other taxa and further records of *B. laticarpus* occur in the British Isles and to give more weight to the anatomical characters being studied, it would be useful if specimens could be collected, especially from freshwater inland sites where '*B. maritimus*' type plants occur and also those where *B. laticarpus* is presently known, to see if any might be *B. yagara*. Plants already identified on fruiting characters are unlikely to be anything else. Fresh specimens are best and only the flowering and or fruiting inflorescences attached to about 10 cm of stem and one leaf (in a plastic bag) is needed, but I would also be interested in any material (but preferably still more or less green). I would be grateful and pleased to receive any material and willing to pay the postage.

Reference:

HROUDOVÁ, Z., ZÁKRAVSKÝ, P., DUCHÁČEK, M. & MARHOLD, K. (2007). 'Taxonomy, distribution and ecology of *Bolboschoenus* in Europe'. *Ann. Bot. Fennici*, **44**: 81-102.

Carex maritima – a roadside halophyte?

PAUL A. SMITH, *128 Llancayo Street, Bargoed, Mid Glamorgan, CF81 8TP;* (pa.smith@mypostoffice.co.uk)
ALISON WILSON, *7 Pine Way, Perth, PH1 1DT*

A succession of halophytes has made its way from the coast to the road verge, with varying degrees of success, well-documented over the years in *BSBI News*. The Outer Hebrides have salted roads just as elsewhere, with a few halophytes strewn along the verges among non-halophyte ruderals, most commonly *Spergularia marina* and *S. media* (Lesser and Greater Sea-spurreys). Over the last two years, however, an unexpected species has turned up regularly on roadsides – *Carex maritima* (Curved Sedge). There was one early record from 2007 between Borve and Scarista in relatively closed vegetation (photo 1, Colour Section, Plate 2), but as this was from the west coast of South Harris, which is the core area for *Carex maritima* in the Outer Hebrides, and where the road runs over the machair, it was not particularly surprising. Then one of us (AHW) discovered a patch on the roadside at Urgha on the east side of North Harris, an unexpected location. This looked like an aberration, as all the other records in v.c.110 (around 80 in 20+ tetrads) were from semi-natural habitats. Some road maintenance was being done, so it could have been introduced in the process.

Table 1: Roadside records of *Carex maritima* in v.c.110

Grid ref	Date	Description
NB41293754	14/08/2011	Cnoc Torravig, Lewis, roadside along 20m in edge of tarmac
NB41593729	14/08/2011	Cnoc Torravig, Lewis, roadside, two heads
NG02499399	13/05/2007	roadside between Borve & Scarista, S. Harris
NG183996	08/06/2011	Urgha, N. Harris, roadside
NG14249631 to NG14239624	05/07/2012	Horsacleit, S. Harris, roadside on gravel
NG030855	06/07/2012	Gleann Shranndabhal, S. Harris, c.10 patches, both sides of road
NG13239454	10/07/2012	roadside near Uabhal Beag, S. Harris, patch 4m long
NG13389442	10/07/2012	roadside near Uabhal Beag, S. Harris, patch 20m long

However, in a later trip to Stornoway in summer 2011, *Carex maritima* was discovered again, growing in the edge of tarmac on the main road leading north from Stornoway. Here it is in the depression at the road edge, growing with *Juncus bufonius* (Toad Rush) in a very narrow strip between the closed vegetation of the verge and the roadway itself (photos 5, 6: Colour Section, Plate 2). Then in 2012, it has turned up in three more places in South Harris, all away from the machair, in one place growing in gravel at the side of the road (photos 3, 4: Colour Section, Plate 2).

David (1982) reviewed the distribution of *Carex maritima* in the British Isles, and catalogued the habitats, but does not mention it as a roadside weed, although he does describe its limited competitive abilities, which seem likely to be favoured by continued/repeated disturbance. The combination of salting and rainwater on roadsides at least superficially resembles the classic sites where *Carex maritima* grows, where fresh water seeps through coastal dunes. The 'Pearman project' on *Carex maritima* (Pearman & Lockton, 2006, 2007, 2008) led to checking of many old records and sites, and to discoveries of new sites, and the balance of evidence here is for it to be transient in sites subject to succession as it is outcompeted.

There are several records of it in anthropogenic habitats, including one explicitly from a roadside near Kirkwall, Orkney (Pearman & Lockton 2007).

So, what is the origin of the roadside plants in the Outer Hebrides? There is a disused sand quarry at Borvemor, South Harris, the floor of which was covered in *Carex maritima* in 2006 (Smith & Pankhurst, 2007 - photo 2 (Colour Section, Plate 2)), and sand extraction continues from a little further north at Niosaboist. So, it is possible that if sand is used in road construction and taken from these sources the *Carex maritima* could have come with it, as rhizomes or, more likely, buried seed. Alternatively, it may be spread by vehicles, as with other roadside halophytes – particularly since it grows on roadsides in machair habitats, which would act as a source. But the site near Stornoway is far from any known native locality, which makes both possible explanations tenuous. If the second reason is generally the right one, it would be worth looking out for *Carex maritima* on roadsides in other places within several kilometres of known sites; and perhaps in due course it will be as common round the road network as *Cochlearia danica*?

References:

DAVID, R.W. (1982). 'The distribution of *Carex maritima* Gunn. in Britain'. *Watsonia*, **14**: 178-180.

PEARMAN, D. & LOCKTON, A. (2006). 'Species mobility and distribution maps'. *BSBI Recorder*, **March 2006**: 7-8.

PEARMAN, D. & LOCKTON, A. (2007). 'Progress with the *Carex maritima* survey'. *BSBI Recorder*, **Spring 2007**: 11-12.

PEARMAN, D. & LOCKTON, A. (2008). '*Carex maritima* update'. *BSBI Recorder*, **Spring 2008**: 11.

SMITH, P. & PANKHURST, R. (2007). 'Field Meeting Reports: 2006. South Harris, Outer Hebrides (v.c.110) 4th - 7th July'. *BSBI News*, **104**: 63-64.

Carex ×*gaudiniana* Guthnick in Scotland

MICHAEL WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

Carex echinata (Star Sedge) × *C. dioica* (Dioecious Sedge) (*Carex* ×*gaudiniana* Guthnick) is a rare hybrid in the UK. It is known in Wales at Hiraethog, Denbighshire (v.c.50) and in Ireland at Bog Lake, Co. Westmeath (v.c.H23) and Louisburgh, West Mayo (v.c.H27) (Jermy *et al.*, 2007).

B.A. Tregale and M. Wilcox went up part of Glen Shee, Cairnwell, towards Meall Odhar and Glas Maol, looking at sedges, rushes and other plants still around, on 6th August 2011. At the bottom of the track near to one of the Glen Shee car parks (approx. grid ref.: NO1477) we spotted *Luzula multiflora s.l.* (Heath Wood-rush) here and a few of these were considered to be the hybrid, *L. multiflora* ssp. *congesta* × *L. multiflora* ssp. *multiflora*. Further up we found many of the known species for this area, such as *Juncus trifidus* (Three-leaved Rush) and *Epilobium anagallidifolium* (Alpine Willowherb).

In a flush just off the track (approx. grid ref.: NO1577) we searched for *Juncus castaneus* (Chestnut Rush), which we found. Then, in the same flush, a small sedge was noted that looked different. It was recognised as a hybrid in the field and we determined it as *C. echinata* × *C. dioica*, and after a glance at the Sedge Handbook (Jermy *et al.*, 2007) it was easily confirmed as this hybrid. The record, with full details, was sent to the vice county recorder, Ian Francis, and later to Mike Porter. I sent a photo of the hybrid to the latter. Mike said he would still like to see some material so we provided a specimen and he replied: "yes, as you say, it is this hybrid".

It would appear that *C.* ×*gaudiniana* is new to Scotland and v.c.92. A photograph is provided to aid anyone looking out for such hybrids elsewhere (see inside back cover).

Reference:

JERMY, A.C., SIMPSON, D.A., FOLEY, M.J.Y. & PORTER, M.S. (2007). *Sedges of the British Isles*. Botanical Society of the British Isles, London. BSBI Handbook No. 1 (Ed. 3).

Hybrid violets

MICHAEL WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

My (MW) article on hybrid violets (*BSBI News*, **121**: 19-21) clearly brought further more enlightened discussion. M. Porter (MP) (*BSBI News*, **122**: 27-28) discusses fertility and back-crossing in *Viola* ×*bavarica*, (*V. reichenbachiana* × *V. riviniana*) (Early Dog-violet × Common Dog-violet) at a more detailed level. Based on my limited findings, "that it wasn't possible to tell if it were a hybrid or in some cases either parent based on general morphology alone; and plants that were more or less fertile were one or the other parent", MP says that plants growing with both parents which exhibit both sterility and morphological intermediacy can be confidently called a hybrid. Whilst this is probably true with some experience (if it is at a stage where sterility of fruiting characters can be observed), it is more or less the same as what I said when flowering only, in that it suggests that the finder has demonstrated in some way that it has both (a certain level of*) sterility and intermediate characters, rather than "it looks intermediate, therefore it is a hybrid". In my case, only flowers were available; therefore my suggestion was that an examination of pollen fertility would be useful only if it was suspected of being a hybrid (*i.e*. with intermediate qualities), as you cannot be certain about the level of fertility of pollen in the field.

In the article (MW), "more or less fertile", as it implies, refers to plants that were more than 95% fertile, way outside the range to be considered a hybrid or even a back-cross. Although partially fertile plants in Germany (Neuffer *et. al.*, 1999) have been found to include F_2 populations, and higher fertility to 60% (Trees-Frick, 1993), my limited findings were either highly sterile (clearly less than 1%) or highly fertile (95% +). The latter figure is likely to be well within an accepted range for the parent species. As suggested in my article, variation in the colour of the spur and other flower characters may initially suggest a hybrid and this may have come from past hybridisation, but at present 95% + fertility (clearly very limited numbers and locations) does not suggest a hybrid or back-crossing for some intermediate-looking plants in these populations, only that it shows variation within the species and hence further evidence was needed to demonstrate that those particular plants were not hybrids; (someone may eventually demonstrate that back-crossing *etc*. does occur in some populations in the UK).

MP rightly points out that there are other characters for identifying *V.* × *scabra* (*V. hirta* × *V. odorata*) (Hairy Violet × Sweet Violet). For me the characters stated in the article (MW) were field characters that I prefer to use to establish a possible hybrid - the variable hair length and variable orientation of hairs (which can easily been seen with a hand lens) and the patch forming aspect (spreading by stolons). Then, checking fertility for an acceptable level of sterility* will point to a credible record. As for all, first get to know the parent taxa well. Others may find other indicators more useful, which would be additional evidence for a hybrid. Again, the article (MW) suggested just pointing to an intermediate in flower and saying it must be a hybrid without further study will increase incorrect records.

F.J. Roberts (FJR), in *BSBI News*, **122**: 29-32, relating to *V.* ×*burnatii* (*V. riviniana* × *V. rupestris*) (Common Dog-violet × Teesdale Violet), shows that experience is invaluable and points out my own admission of inexperience with these plants. FJR also indicates that pollen staining is useful but that we should take into account that other aspects that influence fertility, as the staining does not necessarily prove hybridity. This latter aspect was established and stated in my article. As field botanists 'we' cannot prove most things conclusively, but 'we' can provide evidence which supports the reasonable assumption that it is a hybrid (which maybe rooted in and or backed up by scientific evidence (*e.g*. Jonsell *et. al.*, 2000). My article implied that accumu-

lating evidence must include more than someone pointing at it and saying it is a hybrid (or just because it is known to occur in the area) and then recording it as such in a national database.

In the MW article, I must admit my error in the section on the Teesdale Violet and its hybrid and therefore some of the information is likely to be invalid. I had transposed the images of the leaf shapes (Roberts, 1998, p. 110) in my mind and so the 'ace of spades' shape refers to *V. riviniana* as corrected by FJR. To be fair to myself, I had been ill for a while, but, no excuses, I was wrong. However, I am happy that the highly sterile flowers from one of the plants studied provided good evidence that it was this hybrid, as a reasonable number of flowers were looked at in a mixed population.

I also agree that the sterile capsules would not look like normal expanded capsules. The latter can easily be seen (*e.g.* Ross-Craig, 1950, plates 7-15 & fig. 3, Colour Section, Plate 1 (inset right)). But in order to see these (as in the information above), the plants would need to be at that stage to see them at all. It might be difficult to find individual hybrid plants, and time consuming to search for in over-grazed limestone grassland especially in large populations for a general botanist. My article did not say they looked normal, even if it supposedly implied that, only that any seed inside would be very poorly formed, *i.e.* in this case probably not forming any viable seed at all (there could possibly be exceptions to the rule, see the German situation above).

However, to be clearer about sterile capsules in hybrids from my amateur point of view, in an example such as *V.* ×*intersita* (*V. canina* × *V. riviniana*) (Heath Dog-violet × Common Dog-violet), the sterile nature is usually quite obvious when fruiting and the small sterile capsules are to be found between the sepals (see Fig. 1. Colour Section, Plate 1 (inset left)); also Tregale (2011), p. 28 and colour section, Plate 4). In the case of this hybrid, they tend to put on 'vegetative' growth (quite leafy, as this pair doesn't spread by stolons or apparently by seed) and tend to stand out in the very short grasslands of dunes and heaths as 'clumps' (fig. 2., Colour Section, Plate 1), which, well after flowering, are obviously sterile hybrids. If in flower, the flowers often vary a little in size and there is some colour variation between them, and the plants often seem floriferous. If only in flower, one might provide evidence for the level of sterility of a suspected hybrid plant by staining pollen of several flowers to give yourself confidence that you had more than likely found a hybrid.

For the field botanist, when recording these hybrids, if they are in flower, it is not unreasonable to consider checking for a level of fertility in flowers, (and/or fruit later) that shows a reasonable level of sterility (appropriate to each hybrid pairing*) in combination with other intermediate morphological characters (and if possible send a specimen to an expert). I have seen first hand and by other people's admissions that these hybrids are being recorded by pointing to it and saying "it looks intermediate so it must be a hybrid" (*i.e.* without providing credible evidence). In hindsight, my rather poor amateur article was merely to persuade people to look more closely at these hybrids. The other two articles of MP and FJR, arising from that discussion, provide very important and valuable information at an expert level, drawing out information that cannot be found in the current *Flora* (Stace, 2010); but they in effect do the same as my limited article in that they demonstrate that more detailed study, taking into account several/many characters, including experience of each parent and then their hybrid, is needed to confidently identify most hybrid violets.

*Levels of fertility should relate to those accepted, appropriate to each hybrid pairing, which may take into account any published figures or studies that have been done, as in the case of the German study if possible, but it may not always be available to the general botanist. The latest *Flora* (Stace, 2010) should at least give a good idea of the current thinking for the UK and it is all we can go on as general field botanists, and, as suggested the experts should be consulted if necessary.

References:

JONSELL, B., NORDAL, L., & ROBERTS, F.J. (2000). '*Viola rupestris* and its hybrids in Britain'. *Watsonia*, **23**: 269-278.

NEUFFER, B., AUGE, H., MESCH, H., AMARELL, U. & BRANDL, R. (1999) 'Spread of violets in polluted pine forests: morphological and molecular evidence for the ecological importance of interspecific hybridization.' *Mol. Ecol.*, **8**: 365-377 (quoted in Porter, M. (2013)).

PORTER, M. (2013). 'Hybrid violets at Brockadale and Hetchell Woods – a response'. *BSBI News*, **122**: 27-28.

ROBERTS, F.J., '*Viola*' in RICH, T.C.G. & JERMY, A.C. (1998). *Plant Crib* (1998). BSBI, London. (pp. 107-111).

ROBERTS, F.J. (2013). 'Identification of *Viola rupestris* (Teesdale Violet)'. *BSBI News*, **122**: 27-28.

ROSS-CRAIG, S. (1950). *Drawings of British plants*. Part 4: plates 7-15. G. Bell & Sons, London.

STACE, C.A. (2010). *New flora of the British Isles*. 3rd ed. Cambridge University Press, Cambridge.

TREES-FRICK, I. (1993) 'Karyologische und morphologische Untersuchungen an *Viola reichenbachiana* Jord. ex Boreau und *Viola riviniana* Rchb.'. *Mitteilungen der Naturforschenden Gesellschaft in Bern*, N.F., **50**: 81-98 (quoted in Porter, M. (2013)).

TREGALE, B.A. (2011). 'New taxa found on the Isle of Man (v.c.71)'. *BSBI News*, **122**: 28 & colour section, Plate 4.

WILCOX, M. (2012). 'Hybrid violets at Brockadale and Hetchell Woods, and a search for the Teesdale Violet (*Viola rupestris* F.W. Schmidt) and its hybrid (*Viola ×burnatii* Gremli) with Common Dog-violet (*Viola riviniana* Rchb.)'. *BSBI News*, **121**: 19-22.

Vicia sepium – a yellow form

DAVID PEARMAN, *'Algiers', Feock, Truro, Cornwall, TR3 6RA*; (dpearman4@aol.com)

In August 2012, Mrs Jill Lucas from Huddersfield sent me a yellow *Vicia* to identify, saying she was sure it was not *V. hybrida* (Hairy Yellow-vetch), but was stuck. I tried to identify it - it certainly was not that species (no hairs on the standard) and all the keys led to *V. sepium* (Bush Vetch).

None of *Flora Europaea* (1968), Clapham *et al.* (1962, 1967), Stace (2010) or Sell & Murrell (2009) mentioned this as a possible form, but *Flora Iberica* (1999) did, and a colleague pointed me to my first flower book, McClintock and Fitter's Collins *Pocket guide* (1956), which, with the authors' characteristically terse but first-rate description, says "rather dingy purple, fading bluer, rarely yellow, tending to be bluer in the north". The 11th edition (1925) of the *London Catalogue* does not include any varieties, but Druce, in his *List of British plants* (1908, 1928), does include four, including var. *ochroleuca* Bast.

Chris Preston mentioned that he had seen a yellow form, and kindly drew my attention to two notes in *The Vasculum* (1953, 38: 30):

"The yellow-flowered form of *Vicia sepium* L. Many years ago, the late Mr. Chas. Robson of Birtley discovered the plant known as *Vicia sepium* var. *ochroleuca* Bast. on the old pit-heap on the Long Bank, Birtley (v.-c. 66). Quite recently, on June 17th 1953, I detected a second station for this variety on the railway bankside south of Birtley railway station. Further, I can report the same plant as occurring near Blyth (v.-c. 67). Of these plants, that growing at Blyth was much the finer, as its flower colour was almost as clear a yellow as that seen in the Laburnum.—J.W.H.H. [Heslop Harrison]."

"In studying the vegetation of the dunes between Seaton Sluice and Blyth, and nearer the Seaton Sluice (v.-c. 67) end, I discovered on the grey dunes a specimen of the yellowish-flowered form of *Vicia sepium* which is known as var. *ochroleuca* Bast. This locality is not the same as the Blyth station known to Prof. Heslop Harrison.—W.B.H. Sowerby."

There is also a reference in Grose's *The flora of Wiltshire* (1957), giving several records,

dating back to a white-flowered form noted in the Dillenian Herbarium of around 1724! Other early twentieth century floras, such as Davey's *Flora of Cornwall* (1909), gave records of white or cream coloured flowers. However, there has been little or nothing recorded for the last 50 years, though there are a couple of photographs on iSpot (http://www.ispot.org.uk/node), but these are much paler than Mrs Lucas' specimen. A Cornish botanical colleague, Ken Preston-Mafham, has told me of a large patch, on a roadside, seen in 2012, north of Bodmin, as well as a few plants on another site, not far away, a decade or more ago.

So there seem to be two questions: is there a true variety, var. *ochroleuca*, and does that variety encompass the gamut of colours from white to yellow? I would be very interested in hearing of any further records.

Useful vegetative aspects of *Epipactis* helleborines in Britain

MICHAEL WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

In some cases, Helleborines (*Epipactis* spp.) can be difficult to identify, though they are relatively familiar and more or less identifiable when in flower. The main difficulties lie in plants that are vegetative or have unopened flowers, or the flowers have gone over. There are approximately eight species, with some having various varieties, and possibly some yet-to-be described taxa at various taxonomic ranks (Stace, 2010; Foley & Clarke 2005). To this end, leaves were looked at to see if there were any characters that were helpful for identification. This was done in 1999-2000, but neglected since then for various reasons. However, it was thought to be useful as an aid to their identification, and others, having been made aware of these characters, may have published something (partly) using these characters since.

Species in the British Isles

(leaf-margin teeth and or cells of species covered here*; from (Foley & Clarke 2005):

E. atrorubens (Dark-red Helleborine)*
E. dunensis (Dune Helleborine)*
E. helleborine (Broad-leaved Helleborine)*
E. leptochila (Narrow-lipped Helleborine)
E. palustris (Marsh Helleborine)*
E. phyllanthes (Green-flowered Helleborine)*
E. purpurata (Violet Helleborine (leaves were seen but not photographed*)
E. sancta (Lindisfarne Helleborine) (may just be a form of *E. dunensis*).

This study is only a preliminary account of what has been noted so far. It uses only leaves which, when carefully torn off (a single leaf only) do not affect the flowering of the plants. The leaves of some are quite distinctive for the species and other characters, such as leaf cells, are possibly helpful. This study looks mainly at leaf teeth on the margins and briefly at the leaf cell character. It was difficult to get a leaf of each species, partly because they initially needed to be in flower to make sure of the 'known' identification, but also due to their widespread nature and rarity in some. Clearly there are some taxa that may be different but they are currently accepted in floras at the varietal level as belonging to one of the eight species. Leaf shapes have not been included at this point but silhouettes would have been useful, as shape and length is important too.

***Epipactis helleborine* (Broad-leaved Helleborine)**

The leaves of this species are generally large and obovate, slightly rough on the upper surface. The teeth on the margins are narrow and mainly in one row. At the base of the teeth, they appear singly and are not joined by the translucent material of the 'teeth' at the base (Fig. 1.). The teeth tend to occur along the whole length of the margin.

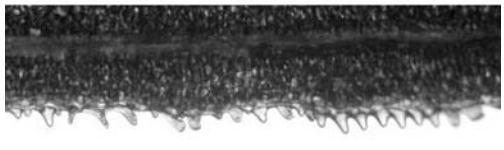


Fig. 1. *Epipactis helleborine* – leaf margin

The cells in the surface of the leaves may also be useful for identification. These are viewed by scraping the green tissue away from below to reveal the clear cells of the upper surface. Some species tend to have relatively distinctive cells, but in general these cells may turn out to be quite variable. As an example *E. helleborine* cells are shown in Fig. 2.

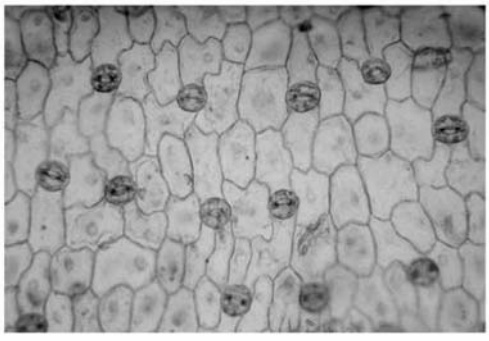


Fig. 2. *Epipactis helleborine* – leaf cells, with only a small amount of corrugation of cell walls.

The cells of one other species are shown below as a comparative example to show how some are relatively different (Fig. 5).

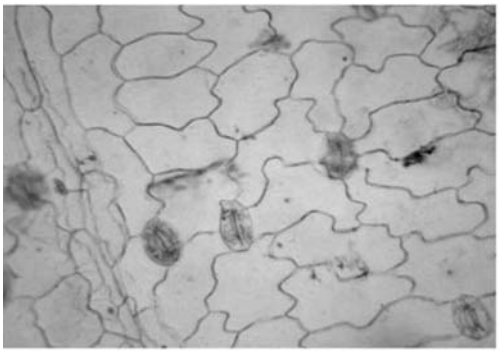


Fig. 5. [1]*Epipactis dunensis* – form from the Wylam river bank with more corrugated cell walls.

Other species exhibit characteristics which are more or less limited to one (or a few) species (the full extent not known at present). For example, although it is not shown here, *E. purpurata* has quite distinctive, relatively narrow leaves, though similar to *E. atrorubens* in some ways, showing the pinkish purple coloration in the leaves, but it has single teeth like *E. Helleborine*, not a double row of relatively blunt teeth as in *E. atrorubens*.

***Epipactis palustris* (Marsh Helleborine)**

The easiest *Epipactis* to identify from its leaves in a vegetative state is *E. palustris*. This species has virtually no distinct teeth on the margins not discernible to the naked eye, occurring as small bumps when seen with a hand lens (Fig. 3).

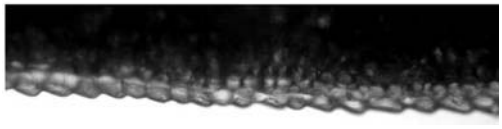


Fig. 3. *Epipactis palustris* – leaf margins appear almost smooth.

It is possible that it could be confused with other orchid species when not in flower (perhaps a comparison of leaf cells may help in this case but I have not looked at the leaves of other orchid species).

***Epipactis dunensis* (Dune Helleborine)**

In terms of similarity, the plants known as [1]*E. dunensis* from the river Wylam, near Newcastle, have similar teeth to *E. helleborine*. However, the leaves are usually much more elongated and narrower generally, although narrow-leaved forms of *E. helleborine* do occur, but are rare. Some are known as varieties. These varieties have not been studied so far. The teeth of the 'Wylam' *E. dunensis* are shown in Fig. 4.

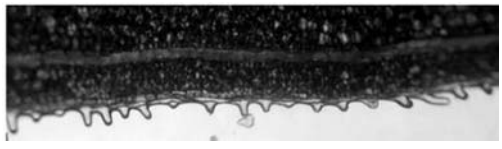


Fig. 4. *Epipactis dunensis* – single leaf teeth, which are narrow and slightly spaced from one another.

The cells, however, may provide a useful separation also, in that they have much more corrugated margins (Fig. 5). The veins on the upper surface tend to be smooth also, as opposed to rough in *E. helleborine*.

One of the interesting things about this species is that plants from other locations seem to be a little bit different. For example, plants known as [2]*E. dunensis* from Sandscale Haws NNR appear to have different leaf characteristics, particularly in the teeth. Their leaf cells

have not been studied yet. The teeth are shown in Fig. 6.

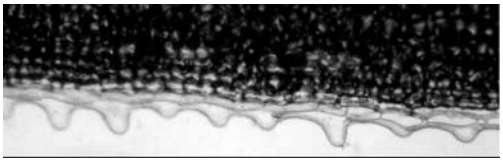


Fig. 6. [2]*Epipactis dunensis* – form from Sandscale Haws with broad blunt teeth joined at the base.

Note that the teeth are more or less joined along the base and are more blunt and broad. This does not occur in the [1]*E. dunensis* from Wylam and the Sefton Coast; those from the latter two areas being the same, with narrow single teeth. These may be different taxa and the plants of Holy Island (*E. sancta*) need to be compared as well. No leaves were looked at, partly owing to the rarity of the Holy Island plants. I did seek permission, but there was no response.

Epipactis phyllanthes **(Green-flowered Helleborine)**

The most distinctive species for its leaf teeth is *E. phyllanthes*. This species has a number of varieties, only told by the flowers, but which have not been studied in any detail for their leaf teeth and other characters. The teeth in this species occur in clusters in uneven groups that are 2-3 deep along the margin. This gives them a 'scruffy' look along the edge and it can be seen that they are obviously interrupted when viewed with a hand lens (Fig. 7).

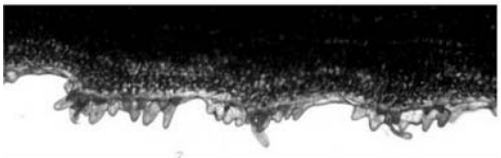


Fig. 7. *Epipactis phyllanthes* – with distinct clustering of interrupted teeth, often 2-3 deep in side profile.

Epipactis atrorubens **(Dark-red Helleborine)**

E. atrorubens has quite distinct leaves in texture and colour and should be relatively distinct, once seen in flower. It is more or less restricted to open limestone habitats. However, the leaves have a different margin, with relatively short, broad blunt teeth that occur more or less in a double row (Fig. 8).

Fig. 8. *Epipactis atrorubens* – showing blunt, broad teeth in a double row (dark teeth = upper row; pale teeth = lower row).

Other taxa

Taxa not studied so far are *E. leptochila* and *E. sancta*, and of course others need further study. Single leaves of other variants noted in the British Isles (such as the Kenfig plants) were sought but, partly due to their rarity, lack of interest and permission, these were not studied. There are long, narrow-leaved plants, with leaves in two rows (not spirally arranged) in northern England (e.g. Hutton Roof and Gaitbarrows), belonging to the *E. helleborine* complex, which have single teeth but otherwise in flower look very like this species, and these have not been studied in any detail – having longer narrower leaves may alter the shape of leaf cells so that character may not be useful in such plants for distinguishing them from normal forms of *E. helleborine*. Genetic studies are likely to continue and may shed further light on these interesting species and their variants in time. However, it has been shown here that the teeth on the leaf margins at least provide a partially useful aid to the identification of a number of helleborines in the UK.

References:

FOLEY, M. & CLARKE, S. (2005). *Orchids of the British Isles*. Griffin Press, Cheltenham.

STACE, C.A. (2010). *New flora of the British Isles* 3rd. ed. Cambridge University Press, Cambridge.

Muntjac and British plants

JACK OLIVER, *'High View', Lockeridge, Marlborough, Wiltshire, SN8 4ED*; (jackeoliver@btconnect.com)

"Overgrazing by a soaring deer population..." is given by Plantlife as one of the main threats to woodland wild plants (Plantlife, 2011). I have watched Muntjac and Roe Deer feeding in Savernake Forest, West Woods and my arboretum at Clatford (all near Marlborough, Wiltshire). Our 1¼ acre garden is a quarter of a mile north of West Woods. Over two years, female Muntjacs with young have made their winter quarters near our back door, only occasionally flushed by our Labradors. As a consequence of this proximity, their winter feeding habits could be quite closely scrutinised.

Seasonal observations

Like other deer, Muntjac seem to take a little bit of anything green, nibbling and moving on. In late spring, summer and autumn, they are too well concealed by greenery always to know what they are feeding on (although they are very partial to *Anthriscus sylvestris* (Cow Parsley) and to *Chamerion angustifolium* (Rosebay Willowherb)). However, in winter and early spring, their nibbling can be watched and the plants checked within minutes or even seconds.

Hedera helix (Ivy) carpets the ground beneath local mixed woodland, and appears to be the main winter staple food for these mother and youngster Muntjac couples. Ivy leaves were grazed over an area of more than 500m^2, leaving the stalks and ignoring the many fallen crab apples (but nibbling some damaged eaters). Ivy contains some poisons, but is eaten by stock and has even been used as a stimulant or treatment for lambs. *Rubus* (bramble) and *Ilex aquifolium* (Holly) leaves were also browsed as part of the Muntjac pairs' winter staple. Holly leaves contain four poisons, but only in small concentrations.

The Mammal Society booklet (Chapman & Harris, 1996) gives the following account of Muntjac eating habits:

> "For much of the year bramble is available in most habitats and in many localities this forms the majority of the food. Ivy is also eaten year round. Other favourites include cow parsley, hogweed, honeysuckle, old man's beard and rosebay willow herb. Seasonally important foods include berries, acorns, chestnuts, beech mast and fungi in the autumn and the leaves and inflorescences of many flowers in spring and summer."

and a little later:

> "When they reach high densities, muntjac can also cause extensive damage to the ground flora, especially to primroses, bluebells, dog's mercury, cuckoo pint and other native wild flowers. In one study plot in a National Nature Reserve, not only were the bluebell leaves unusually short, but 98% of the inflorescences were eaten between the bud and seed stage."

Poisonous plants seen to be eaten by Muntjac

Triterpenoid saponins from Ivy (*e.g.* hederosaponin-c) can make humans ill, but, as noted, Muntjac thrive on Ivy as their winter staple. Humans could also be made very ill by eating the leaves of *Ficaria verna* (Lesser Celandine), containing protoanemonin and ranunculin) but the Muntjac nibbled them happily. The same goes for *Mercurialis perennis* (Dog's Mercury), whose mixtures of mercurialine, trimethylamine and volatile oils give humans severe gastroenteritis and can cause blood haemolysis.

Arum maculatum (Lords-and-ladies) has an unpleasant cocktail of eight or more poisons, including various alkaloids, aroine, nicotine, saponins, cyanogenic glycosides, acrid substances and oxalates. Sharp raphides, which can puncture mammalian mucous membranes, inject the toxins, thereby increasing their toxicity (see also Frohne & Pfander, 1983). Muntjac relish Arums; their

leaves, but most especially the spathes and spadices (Fig. 1, see Colour Section, Plate 4)). This attack on inflorescences is typical of Muntjac.

The leaves of *Prunus laurocerasus* (Cherry Laurel) are so rich in cyanogenic glycosides that Health and Safety regulations forbid the wood-chipping of this shrub within a confined space, on account of the intensely poisonous prussic acid (HCN) vapour. Muntjac nibble the leaves of young Cherry Laurel plants, sometimes only leaving a twiggy skeleton .

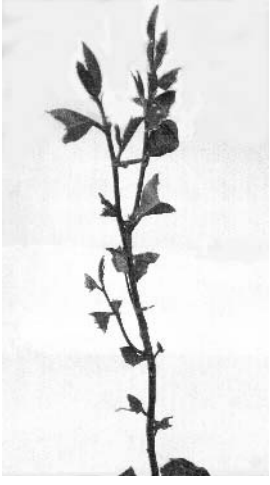


Fig. 2: *Prunus laurocerasus* (Cherry Laurel) skeletonised by Muntjac, near West Woods, Wilts. Photo J. Oliver © 2012

They also browsed two equally poisonous young *Prunus lusitanica* (Portugal Laurel) shrubs, rounding their outlines as if subjected to topiary. This species is even poisonous to goats.

Other poisonous plant leaves nibbled include *Tulipa* spp. (tulips) (tuliposides A and B, tulipalins A and B) and *Iris foetidissima* (Stinking Iris) (the glycoside iridin). So far, our local Muntjac have spared *Narcissus* (Daffodils), but have cropped *Galanthus* (Snowdrops). These two genera contain the alkaloids lycorine and galanthamine (which in humans cause vomiting, diarrhoea, central nervous paralysis and collapse), plus the needle-like calcium oxalate raphides, which facilitate more rapid absorption of the poisonous alkaloids (for plant poisons, see Frohne & Pfander, 1983; MAFF, 1988 and Woodward, 1985). Finally, Muntjac were almost certainly responsible for eating at different times the flowers, leaves and stems of two *Daphne mezereum* (Mezereon) plants. The parts eaten were all highly toxic, including poisonous diterpenoid esters and daphnetoxin.

Mammals and plant toxins

This topic was considered previously (Knight, 1998) and subsequently in some detail (Oliver, 1998). Dr Yalden, President of the Mammal Society in 2012, says that there is always the possibility of certain specific detoxifying enzymes being present (the same could apply to gut bacteria versus certain poisons). However when the mammal can cope with a diverse range of very differently acting plant poisons, an improbable battery of different enzymes would be required. He thinks that eating by deer of potentially lethal poisons "a little here and a little there" is achieved without harm to the animal because any specific toxic effects of any one plant poison are diluted by the variety of alternative vegetation ingested. This has been proven for Okapi (D. Yalden, pers. comm., 2012).

Forestry

Forestry Authority rangers incriminate Muntjac as 'public enemy number one'. In my arboretum, they can scrape under tree guards to tweak out young saplings, to eat stems and leaves, especially destroying or even uprooting green stems in winter. Sapling leaves seen to be browsed and cropped included 16 *Sorbus* species (including six rare native endemics) and seedlings and leaves from young plants of the following genera: *Acer*, *Aesculus*, *Betula*, *Corylus*, *Cotoneaster*, *Crataegus*, *Fraxinus* (mainly seedlings), *Malus*, *Photinia*, *Populus*, *Prunus* (especially *P. avium* (Gean) suckers), *Pyrus* and *Tilia*. If Muntjac continue to spread, some populations of our rare and endemic native *Sorbus* trees could be at risk. "Most, if not all *Sorbus* species are palatable to animals and thus sensitive to grazing, and it is probably for this reason many are confined to open, steep rocky cliffs. When grazing is removed or of low intensity they can be

rapid colonists of open ground." (Rich *et al.*, 2010).

Rarer herbaceous species

Muntjac enjoy the native *Ornithogalum pyrenaicum* (Spiked Star-of-Bethlehem), preventing its re-establishment locally. It is frustrating to try to identify helleborines when all the inflorescences have been eaten off. *Epipactis helleborine, E. purpurata* and *E. phyllanthes* (Broad-leaved, Violet and Green-flowered Helleborines) are all becoming scarcer in Savernake Forest as Muntjac (and other deer) eat them, Muntjac specialising in cropping nearly all the flower heads as well as nibbling leaves. Interestingly, Muntjac and Roe Deer seem to spare the eerily beautiful, translucent pink-lilac stems and inflorescences of *Epipactis purpurata* var. *chlorotica* Erdner, looking like Venetian glass and free from chlorophyll (which may develop later - see Oliver, 2001).

Preferences

The belief that all deer avoid the *Allium* genus is not fully born out locally, as mother and young Muntjac pairs had their hideaways in or right on the edge of expanses of *Allium ursinum* (Ramsons). However, these were never nibbled, in contrast to Spiked Star-of-Bethlehem (plundered), or Snowdrops and *Hyacinthoides non-scripta* (Bluebells) (intermittently grazed). Leeks, Onions and Chives were not touched, but Muntjac repeatedly raided Runner-bean leaves, flowers and shoots. I have not so far seen Muntjac cropping *A. vineale* (Wild Onion) or *A. triquetrum* (Three-cornered Garlic) leaves or inflorescences.

Coniferous foliage seemed to be disregarded, even in winter. Evergreen *Lonicera nitida* (Wilson's Honeysuckle) was untouched. *Aegopodium podagraria* (Ground-elder) was not favoured. *Urtica dioica* (Common Nettle), thistle leaves and *Glechoma hederacea* (Ground-ivy) (not *Hedera*) were avoided. Muntjac may dislike the volatile oils of the last. In some Muntjac-grazed areas, *Hedera* had given way to *Glechoma* as the ground cover.

Muntjac could show some persistence with Ivy (in winter), Cow Parsley, Rosebay and Runner-beans. However the general rule was to raid any angiosperm inflorescences in summer and nibble angiosperm evergreen leaves and green stems in winter, however poisonous, with only a few exceptions.

Summary

Muntjac go for most green angiosperms, however poisonous. It is hard to resist the conclusion that they pose a serious threat to uncommon woodland herbaceous species, not just because of leaf-nibbling, but more on account of their predilection for eating complete inflorescences. They could also prevent the regeneration of rare and endemic tree species (*e.g. Sorbus*) by eating seedlings and young saplings.

References:

CHAPMAN, N. & HARRIS, S. (1996). *Muntjac.* Mammal Society, London.

FROHNE, D. & PFANDER, H.J. (1984). *A colour atlas of poisonous plants.* Wolfe Science Books, Stuttgart.

KNIGHT, G. (1998). 'So you don't like mints?' *BSBI News*, 7**8**: 48-49.

MINISTRY OF AGRICULTURE, FISHERIES & FOOD (1988). *Poisonous plants and fungi.* Her Majesty's Stationery Office, London.

OLIVER, J. (1998). 'Plant defences versus mammals'. *BSBI News*, **79**: 24-27.

OLIVER, J. (2007). 'Chlorophyll & Violet Helleborine'. *BSBI News*, **86**: 19.

PLANTLIFE (2011). *Forestry recommissioned: bringing England's woodlands back to life*. Plantlife, (Winter issue) **61**: 5.

RICH, T.C.G., HOUSTON, L., ROBERTSON, A. & PROCTOR, M.C.F. (2010). *Whitebeams, rowans and service trees of Britain and Ireland.* Botanical Society of the British Isles, London. BSBI Handbook No. 14.

WOODWARD, L. (1985). *Poisonous plants*. David & Charles, Frome.

Yalden, D.W. (2012). Personal communication.

Footnote: Over half an acre in Feb. 2013, Muntjac have eaten all the *Crocus tommasinianus* (Early Crocus) inflorescences, and grazed the leaves down to 7cms.

'Switching on' of purple colouration: chromoplasts, heterophylly and other genetic aberrations in local Sycamores

JACK OLIVER, *'High View', Lockeridge, Marlborough, Wiltshire, SN8 4ED*; (jackeoliver@btconnect.com)

Previous publications (Oliver, 2003, 2008) were based on the assumption that local aberrant heterophyllous green or purple *Acer pseudoplatanus* (Sycamore) trees south-west of Marlborough derived from just one 'mutant' heterophyllous green-leaved tree. This now seems not to be the case.

'*Atropurpureum*' types

Bean (1989) attributed the first description of a Sycamore with rich purple under-leaves to Loudon in 1928. The tree arose in Jersey, and was originally called var. *purpureum*. "Forms of this nature, but with the colouring less rich, have probably arisen many times and may breed more or less true from seed" (Bean, 1989). The local purple Sycamores are of three types, depending on when the colour develops:

- From six-leaf seedling onwards;
- From about 35 years onward; trees previously green. (These two trees might have derived from Sark seed, so conceivably had Jersey Sycamore ancestry).
- Two green saplings. One was cut to the base, the other was burnt by a bonfire. Both subsequently developed rich purple under-leaves; thenceforward no return to green (four years on).

Heterophylly

Of the recent saplings, roughly one third of the leaves were normal 5-palmately lobed, one third were 3-palmately lobed, or variously intermediate, and one third had three main leaf types:

- Simple leaves, unlobed; rather more like the leaf shapes of *Prunus avium* (Gean) rather than *Castanea sativa* (Sweet Chestnut) ('Prunaviform' rather than 'Castaneiform', ovate-elliptic, but some cordate (Fig. 1, see Colour Section, Plate 3)).
- Sub-trifoliate, or actually trifoliate (Fig. 2).
- Characteristic semi-hastate leaf blades, toothed, jagged and sometimes asymmetric at base (Fig. 3).

The first category leaves could often be organised as neat, opposite, decussate pairs, alternating with pairs of more normal Sycamore leaves.

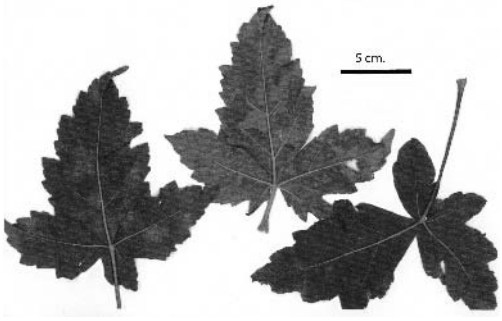


Fig. 2. Trifoliate Sycamore leaves (three fully separate leaflets in each, albeit overlapping).

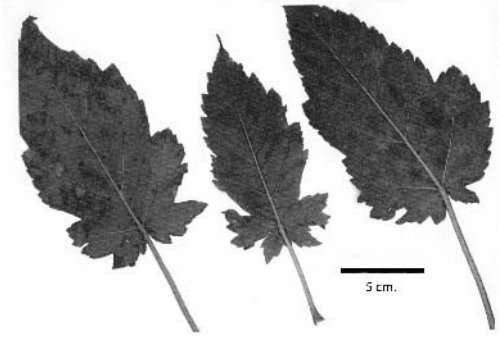


Fig. 3. Semi-hastate Sycamore leaves.

Combined purple and heterophyllous saplings

There were combinations of all the different heterophyllous types, with either green or purple trees (Fig 4, see Colour Section, Plate 3). Purple heterophyllous saplings were just as vigorous as normal green Sycamores. Some exceptionally fast-growing purple trees seemed to have inferior wood, snapping easily in high winds.

Genetic *versus* environmental effects

Nutrient depletion can be ruled out as a contributant to the empurpling and heterophylly, as both features persisted in healthy saplings which grew amongst the many normal green Sycamores. Nevertheless, the initially hidden propensity of some green saplings to become permanent '*atropurpureum*' types needs either age or the trigger of an environmental shock.

The red anthocyanin flush on the upper surfaces of leaves of tender new shoots from cut-back branches exposed to strong sunlight (as a protective reaction against ultraviolet damage to young meristematic tissues?) was wholly different in colour, timing, distribution and other appearances from the rich empurpling of leaf under-surfaces (see below: ' Histology').

It should also be noted that other genetic oddities were found in the immediate vicinity; some, but not all, deriving from the 33-year-old heterophyllous but green tree. These included a dwarf Sycamore producing healthy samaras at only 120cm in height; seedlings with cream or pink blotching of the leaves; and seedlings with sectorised cream and/or pink areas, indicating absence of chloroplasts in parts of the leaves, semi-regularly patterned. Such plants with limited green areas on their leaves compete very poorly with the green or purple-leaved Sycamores, needing much care and protection to survive.

Histology

Figure 5 (Colour Section, Plate 3) shows the living underside leaf mesophyll and veins from a Sycamore sapling which switched from green to purple. The colours are actual, under high-power microscopy, with no colour filters. There appear to be rounded magenta-purple chromoplasts (size mostly 12-18µ) crowding the chloroplasts (size mostly 5-7µ). Some of the mesophyll chromoplast cells are forming in rings. Over the veins, pigmented bodies, appearing to be big chromoplasts (cell walls not visible) are elongated. No such pigmented bodies are to be seen in green Sycamore leaves.

For comparison, I examined the mesophylls of normal green Sycamore leaves, red-anthocyanin-tinged tender young sun-exposed Sycamore leaves, and the mesophyll from leaves of *Fagus sylvatica* '*purpurea*' (Copper Beech) (Fig. 6, see Colour Section, Plate 3). The Copper Beech leaf mesophyll chromoplasts are similarly coloured to those of the purple Sycamore, but with irregularly edged rather than rounded outlines. Some chromoplasts over the Copper Beech leaf veins were irregularly outlined as well as elongated. As a total contrast, in the anthocyanin-tinged sun-exposed young Sycamore leaves, all tissues appeared to be generally and diffusely tinged red.

Summary

To this amateur botanist, large purple-magenta chromoplasts forming in the mesophyll and other leaf tissues appear to be responsible for the purple colouration on the under-surfaces of Purple Sycamore leaves. Some such trees start purple. Others become purple as they mature. A few need a physiological shock in order to change from green to permanent purple. Such processes bear no relationship to the red-tingeing of sun-exposed tender young leaves, or to autumnal colourations.

This small new population of vigorous Sycamores has also thrown up other genetic abnormalities, principally leaf shape aberrations, and a range of heterophyllies not previously described elsewhere. Purple saplings, heterophyllous saplings, and purple heterophyllous saplings all compete well with the many surrounding normal green trees.

References:

BEAN, W.J. (1989). *Trees & shrubs hardy in the British Isles*. Vol. 1 (A-C) (revised 8th ed.). John Murray, London.

OLIVER, J.E. (2003). ''Chestnut-leaved' European Sycamore'. *Maple Society Newsletter*, **13/14**: 4-5.

OLIVER, J.E. (2008). 'Local Sycamores (2): vigour, progeny and unpredictably variable leaf shapes and colours'. *BSBI News*, **109**: 24, 35.

New Year's Day Hunt 2013

TIM RICH, *Biodiversity & Systematic Biology, National Museum of Wales, Cardiff, CF14 6JN*; SARAH WHILD, *Manchester Metropolitan University (Shrewsbury Office), The Gateway, Shrewsbury, SY1 1NB*

The very mild winter weather of 2011-2012 ended the second warmest year on record since 1910. This allowed many wild flowers to continue flowering through the winter, when they would normally have finished in the autumn or when knocked back by the frosts. After noticing quite how many plants were still flowering in December 2011, on 1st January 2012 we had fun spending three hours around Cardiff noting plants in flower. The discovery of 63 species in flower was much higher than we would normally have expected. Not only was the diversity unusual, but so was the repeated pattern of widespread flowering of many individual plants of each species. A summary is given on the NMW website (http://www.museumwales.ac.uk/en/rhagor/article/unseasonal_flowers). The unusual findings also received widespread coverage in the media.

Through the BSBI Facebook page, this year we invited BSBI members to have some fun and carry out their own hunts on 1st January 2013 to provide more comparative data. The 'rules' were basically to list species seen in flower in up to three hours over the New Year's day period from Saturday 29th December to Tuesday 1st January (to allow for poor weather). The results were as follows:

Date	Recorder	Place	No. species	Notes
30/12/2012	Warwickshire Flora Group	Leamington Spa	20	3 hours
01/01/2013	Shropshire Botanical Society	Shrewsbury	31	3 hours
01/01/2013	Tim Rich & Ceri Gait	Cardiff	52	3 hours
01/01/2013	Elise O'Donnell	Cawood, York	28	2 hours
01/01/2013	Louise Marsh + five	Leicester	42	3.5 hours
01/01/2013	Paul Green	Mont Ventoux, Provence, France	25	2 hours
01/01/2013	Jerry Clough	Nottingham	20	c. 1 hour
01/01/2013	Dawn Nelson	Midhurst, Sussex	33	3 hours

Overall, New Year 2013 was less floriferous than New Year 2012. It was noticeable in Cardiff that although the diversity of 52 was still quite high, for many species there were only isolated individuals struggling to flower, compared to numerous specimens the previous year. Its coastal situation may have helped, with milder weather than many of the more inland sites. The Warwickshire Flora Group braved cold winter rain for their 20 species. Paul Green's French list had many species we could only dream of seeing.

Garden plants were also flowering – the Leicester group found another 20 garden plants in flower. For comparison, Jenny and Heidi Rich listed 31 garden plants in flower in Cardiff on 7th January 2012.

Thanks to all those who participated! Everyone will be welcome to join in the hunt on 1st January 2014, which will also be organised through the BSBI Facebook page.

'Time travel' – modelling the historical distribution of *Sedum villosum* in Berwickshire

MICHAEL BRAITHWAITE, *Clarilaw Farmhouse, Clarilaw, Hawick, Roxburghshire, TD9 8PT*; (mebraithwaite@btinternet.com)

[This article is an extract from 'Changes in the Berwickshire flora since the *New atlas*', a presentation at the BSBI Conference in Edinburgh in 2012: 'A great leap forward: biological recording since the 1962 *Atlas of the British Flora*'. An article based on the full presentation is available for free download as a PDF on the BSBI website under 'Berwickshire' or 'Conference Reports'.]

Summary

Following a full re-survey of *Sedum villosum* (Hairy Stonecrop) in Berwickshire, v.c.81, the rate of decline between various date-classes has been calculated (Braithwaite, 2010). It has then been a simple mathematical exercise to extrapolate backwards in time to calculate the number of monads in which the species is likely to have been present at various dates in the past. Taking these estimates together with historical localities and a detailed knowledge of the v.c. and its history of botanical recording, informed guesses have been made of the individual monads in which there may have been former populations of *Sedum villosum* which were never discovered.

Introduction

The Scottish Borders is the headquarters of *Sedum villosum* in Britain and it is, or has been, frequent across the Lammermuirs and the Southern Uplands from Berwickshire in the east to Peeblesshire to the west. J.M. Croft describes the species in the *New atlas* as growing "in at least slightly base-enriched, wet, stony ground and on streamsides in hilly areas, and in montane, often bryophyte-rich, flushes".

I have been recording *Sedum villosum* in Berwickshire, v.c.81, since 1979 and have visited all the historical sites listed in the Berwickshire rare plant register (Braithwaite, 2004). Those with extant populations when visited between 1979 and 1999 have all been re-visited between 2008 and 2010. A series of sites where the species was not re-found when re-visited in 2009 have been visited again in 2010, but no further populations were re-found.

Data table

The survey results may be summarised as follows:

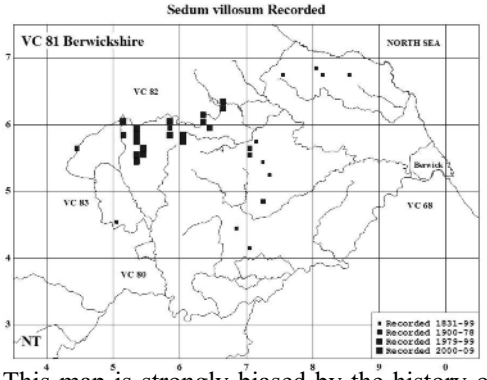
Table 1: Losses of populations of *Sedum villosum*

Dateclass	1831-1899	1900-1978	1979-1999	2000-2011	Ever (recorded)	Ever (extrapolated)
Sample	11	10	12	10.5	33	75
Survival	1	3.75	7	10.5	10.5	11
Losses	10	6.25	5	0	22.5	64
% Loss/decade	14	17	31			11
Extrapolated monads (* more realistic figure)	114 (*75)	27	22	11		
Date extrapolation	1849	1959	1989	2009		1849

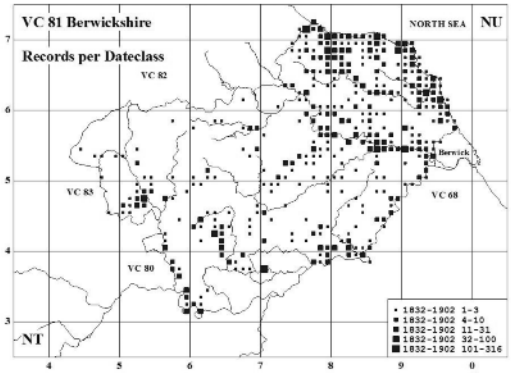
The table may be understood by working through the oldest date-class, 1831-1899, as an example. The average date of the 11 monad records held is 1849. Re-survey in 2009 re-found *Sedum villosum* in just one of these 11 monads (and in no monad was the species thought to have been possibly overlooked and thus meriting a fractional score). This is equivalent to a loss of 14% in each decade between 1849 and 2009.

Modelling the historical distribution on a map

The conventional 1km map of *Sedum villosum* by date-class is as: Fig. 1.



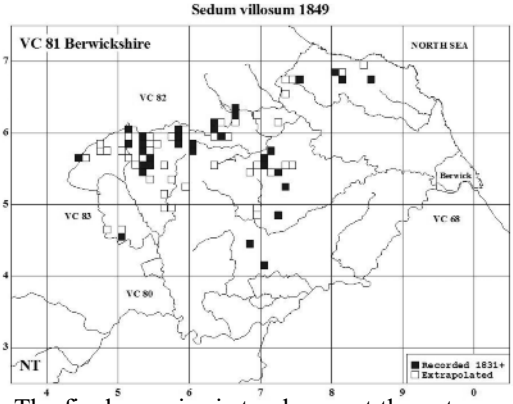
This map is strongly biased by the history of botanical recording in Berwickshire. While the early botanists visited the hills quite often, they very seldom recorded detailed localities of their finds there. So, there is little evidence of the historical distribution of *Sedum villosum* in its core area in the heart of the Lammermuirs. This history of botanical recording is demonstrated by a coincidence map for all species: Fig. 2



I have allocated the estimated 'missing' records of *Sedum villosum* for the earliest date-class to individual monads on the map. This is much less subjective for *Sedum villosum* than it would be for most species. The habitat is so distinctive that it is realistic to allocate the former populations to known flushes in the hills, which have been cut-over in the past or otherwise degraded and are no longer suitable for the species.

It soon became apparent that the estimate of 114 monads for 1849 could not be allocated realistically on the ground, so I modified it to 75 monads, about two-thirds of the estimate. Two factors are thought to come into play. Firstly, the estimate of 114 monads is very imprecise. Secondly, there is reason to expect a lower rate of loss in the core area of the distribution in the heart of the Lammermuirs where the historical coverage was poor. As long as there is a core area where a species is frequent, losses at monad scale will be mainly at the fringes. That is to say, losses thought to have been suffered when a proportion of the flushes with populations of *Sedum villosum* were cut-over only affected the monad distribution in areas where the species had only one or two populations at monad scale. Reducing the estimated 1849 distribution from 114 monads to 75 monads reduces the average loss per decade from 14% to 11%.

The result of this allocation is as in Fig. 3



The final exercise is to phase out the extrapolated monads for 1849 over later date-classes in the proportions indicated by the data table. This completes my experiment in 'time travel': Fig. 4 shown overleaf

The map shows *Sedum villosum* retreating into the Lammermuirs as the lowland habitats were physically destroyed and suggests that there were also losses from an early date in the hills from where there are few localised historical records. The overall extent of the severe losses is all too apparent. While many of the early losses are thought to have been due to

flushes being cut-over, the causes of the dramatic recent losses are uncertain. Eutrophication and climate change are the prime suspects. It is suggested that these factors act to dramatically accelerate a natural process of vegetation succession.

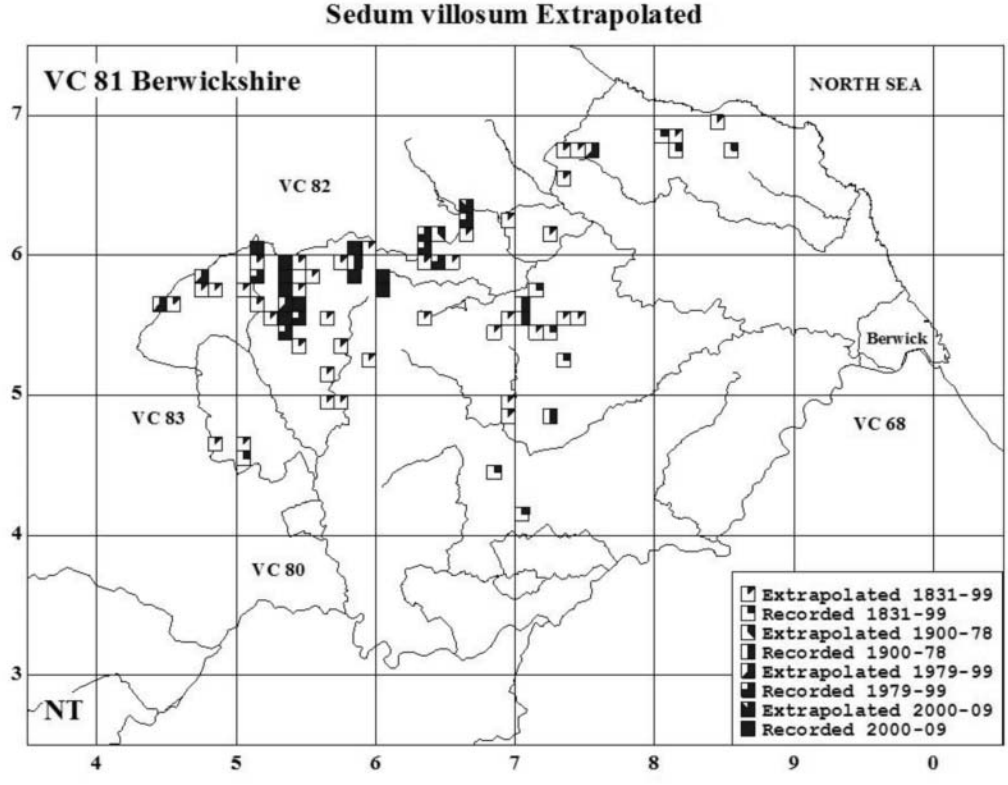
References:

BRAITHWAITE, M.E. (2004). *Berwickshire rare plant register*. Privately published.

BRAITHWAITE, M.E. (2010). 'A wake-up call for the future of Britain's montane flora? - *Sedum villosum* in decline in Berwickshire, v.c.81'. *BSBI News*, **115**: 15-17.

PRESTON, C.D., PEARMAN, D.A. & DINES, T.D., (2002). *New atlas of the British and Irish flora*. Oxford University Press, Oxford.

Fig. 4



Extinctions in rare or scarce species – what do they tell us about change in the flora?

MICHAEL BRAITHWAITE, *Clarilaw Farmhouse, Clarilaw, Hawick, Roxburghshire, TD9 8PT*; (mebraithwaite@btinternet.com)

Introduction

I have studied extinctions in native species in the flora of Berwickshire, v.c.81, both at county scale and at population scale for more than a decade. The studies are of species that are rare or scarce (R&S) in the vice-county. I have reported a loss of R&S populations of about 16% a decade between a repeat survey started in 2007 and a similar survey carried out between 1987 and 1999 (Braithwaite, 2010). I am currently working on historical date-classes back to 1828. I have been becoming more aware of the bias in this sample of the flora and this article seeks to put the results of such studies in perspective against the broader goal of chronicling change in the flora of the vice-county as a whole.

The rationale for focusing on R&S species is that a majority subset of such species has a good historical record. For such species, detailed localities have been recorded throughout the history of botanical survey and, for the more recent decades, the localities have been at 6-fig grid reference scale or finer. I have made it one of my personal goals to make a repeat survey of almost all of the populations of R&S species in Berwickshire which might conceivably survive today. This allows estimates to be made of losses (but not gains) that are not affected by the different intensities of sampling over the history of botanical recording and thus differ from the estimates of relative change from repeat Atlas-type surveys of an area.

An obvious downside of working with R&S species is that the datasets are small and there are, by definition, only a few populations per species. So analysis is by groups of species that may or may not have much in common other than the criterion by which it is chosen to group them.

Species selection

Peter Marren caused controversy a few years ago by analysing lists of extinctions published in county floras and claiming that, on average, one species a year was becoming extinct at v.c. scale (Marren, 2000). Kevin Walker has applied some much needed rigour to the study of extinctions and published criteria for use in selecting species for such comparisons (Walker, 2003). The re-worked analysis suggested a loss of about one species every two years, which is still a horrific rate of loss. The following taxa are excluded: doubtful and unconfirmed records, archaeophytes and neophytes, populations of native species that might have been casual or deliberate introductions, and all segregates such as microspecies, hybrids, subspecies and varieties. For an effective application of similar criteria see Preston (2000).

I have followed these criteria and have added two further ones. The first is the exclusion of species with an inadequate historical record. This covers relatively critical species such as *Alchemilla glaucescens* (Silky Lady's-mantle), *Erophila majuscula* (Hairy Whitlow-grass), *Polypodium interjectum* (Intermediate Polypody) and *Viola canina* (Heath Dog-violet). The second is that mobile species be excluded, leaving only species that are site-faithful in the context of the vice-county. This criterion only applies to studies at population scale. At v.c. scale, it is already covered by the exclusion of casuals.

A habitat approach

To understand what this species selection accepts and excludes it is useful to analyse the relevant species by broad habitat. I use a simplified set of ten such habitats in Berwickshire.

Table 1: Berwickshire native rare and scarce species, 1828-1999

Habitat	R&S spp.	Extinct spp.	Mobile spp.	Site-faithful spp.	Site-faithful populations	Sample size
Aquatic	25	9	6	19	128	Medium
Arable	1	0	1	0	0	Nil
Coast	30	2	1	29	193	Large
Grassland	50	15	3	47	501	Large
Moorland	16	5	4	12	106	Medium
Riverside	6	2	0	6	42	Small
Rock	6	1	0	6	44	Small
Ruderal	1	0	1	0	0	Nil
Wetland	33	8	1	32	288	Large
Woodland	27	7	1	26	268	Large
Total	195	49	18	177	1,570	

Several broad habitats have few native R&S species. Most arable weed species are archaeophytes and many of the native species present are found in several habitats: these I have usually classified under their most natural habitat. Thus *Scleranthus annuus* (Annual Knawel) was formerly found both as an arable weed and in dry rocky grassland. It is now extinct as an arable weed but survives in grassland and is classified as such. There is a fairly distinctive riverside flora in Berwickshire, but most of the species are either widespread or neophyte, or both. The rock flora is fairly modest and many of the rarities are *Hieracium* species (hawkweeds), which are excluded as microspecies. The ruderal flora includes widespread native species, but the scarce ones are either archaeophyte or neophyte, or are native species also present in a natural habitat, under which I have classified them.

It is convenient that the arable habitat drops out, as the site-faithful concept is not applicable to this habitat, nor is the historical record satisfactory. A repeat tetrad flora approach may well be the most practical way to assess change in arable weeds and this was a group for which the BSBI Local Change repeat survey yielded broadly satisfactory results (Braithwaite *et al*., 2006).

Berwickshire's moorlands are rather species-poor and many of the more specialised species in the hills are classified as wetland species. The species excluded as mobile are four of the clubmosses, three of which have recently colonised forestry rides, sometimes in abundance.

The coast is more of a problem than appears from the table. If the dataset were larger, it might be better divided into two: the plants of the shore itself and those of the sea braes and cliffs above the shore. It is on the beaches that the problem arises. Berwickshire's coast is a rocky one and its beaches are few. Most of these are boulder beaches, with just a small number of sandy ones. Saltmarsh is restricted to a few tiny fragments. In these circumstances it is not really surprising that several species have suffered local extinction from storm damage, sometimes followed by re-colonisation after an unpredictable interval. Several such R&S species are excluded as casual, and another, *Cakile maritima* (Sea Rocket), is treated as mobile.

Much the most frustrating habitat is the aquatic one. There are a series of issues that make analysis difficult. The River Tweed and its tributaries have a rich aquatic flora, which is quite well recorded. There appear to have

been major losses from this flora in recent years, but losses on a site-by-site basis (using 1km stretches within hectads as a default) are difficult to prove. There are certainly some poor years for aquatics after heavy floods and there are other years when the prevalence of floods leaves little opportunity for survey. Then there is the unknown frequency of re-colonisation events from seed or vegetative fragments carried down the river or transported by wildfowl. I have therefore discarded the species of the main rivers as mobile. Meanwhile, some of the species that require nutrient-poor conditions are restricted to certain of the smaller tributaries and can be retained as site-faithful. Ponds, lochs and reservoirs are equally problematic. There appears to be a considerable turnover in the species mix of many such water-bodies in response to changes in water chemistry. It would be 'one-way traffic' to more eutrophic conditions if it were not for the creation of new ponds, a minority of which have been dug in nutrient-poor upland habitats. The main reservoirs are an important special case of this. For example, *Littorella uniflora* (Shoreweed) is now considered extinct at all its natural sites in Berwickshire, but it has colonised the reservoirs, where the extent of its populations may exceed that of all the populations that have been lost. The existence of opportunities for colonisation suggests that statistics for loss on a site-by-site basis could be unduly pessimistic.

The new ponds and reservoirs are themselves a special case of the issue of man-made habitats in general. In relation to R&S species in Berwickshire, the most important example is forestry roads, though other roads and the now-disused railway lines are further examples. The access roads built in the recently-established conifer forests are often very stony, constructed with coarse chippings from small-scale quarrying on site, though some of the material is sandier. Such habitat is nutrient-poor and allows colonisation by a suite of moorland and grassland species, some of which are R&S. Examples are the clubmosses already referred to, *Spergularia rubra* (Sand Spurrey) and *Euphrasia micrantha* (Slender Eyebright), though the latter is excluded from the analysis as a critical species. One would be more welcoming of such a chance blossoming of the flora if one were persuaded that the habitats would survive for long. For the clubmosses in particular, the opportunity seems destined to be but a temporary one, with the habitats changing both from vegetation succession and from eutrophication, especially during periods of timber extraction.

While it is certainly true that some of the R&S species have found alternative habitats and are prospering to a degree, I suggest there is still merit in presenting an analysis that ignores these alternative habitats and focuses on the losses from more natural habitats. So I have excluded the species colonising man-made habitats from my analysis as 'mobile'. Nevertheless, one needs to be aware that excluding species with gains from the analysis will lead to trends that are more pessimistic than those generated from repeat tetrad or hectad mapping projects (if the variation in sampling between such surveys could be eliminated). To keep a sense of perspective, it is important to note that the species excluded as 'mobile' are less than 10% of the R&S species.

The site-faithful approach

The validity of the analysis of R&S populations depends on the validity of the site-faithful approach. It is very much a question of scale. At very fine scales (1m) almost all populations are mobile over time. The Berwickshire habitats are highly fragmented. This is the legacy of the field system created by the enclosures of the Agricultural Revolution in the half-century around 1800. Such a landscape is very different from the ancient one to which the flora migrated after the ice age. Many species are now site-faithful at 1km scale, as there is nowhere left to disperse to. 1km is the scale chosen for analysis. The finer-scale data now held is most useful for re-locating the populations and recording their extent but is not so useful for analysis. It is just not practical to analyse the fine-scale changes over the vice-county as a whole, and in any case there is very limited historical data at fine scales.

It is idle to deny that there is some possibility of dispersal between contiguous sites and certainly there is little problem for many of the more widespread species. However, the R&S species are now so localised and faring so poorly that there is negligible colonisation. Examples are *Sherardia arvensis* (Field Madder) in grassland and *Genista anglica* (Petty Whin) in moorland.

This leaves the incidence of long-distance dispersal to consider. One class affected is of the aquatic species of rivers, already discussed, and riverside species are dispersed in a similar way. There is certainly a resulting dynamism in the vegetation of riversides, but the main beneficiaries are widespread native species and some neophytes. I have only made a very few consequential exclusions of R&S species as mobile, one example being *Epilobium roseum* (Pale Willowherb).

Further classes of species affected by long-distance dispersal are clubmosses, ferns, orchids and wintergreens which have tiny wind-blown spores or seeds. Analysis of the historical record for *Neottia* (=*Listera*) *ovata* (Common Twayblade) and *Pyrola minor* (Common Wintergreen) strongly suggests a cycle of colonisation and losses with individual populations having a half-life of something of the order of 100 years. I have accordingly accepted these two species as site-faithful when analysing a repeat survey after an interval of 16 years, but have excluded them as mobile when analysing data over longer time-frames. The only Berwickshire R&S species with a well-developed pappus is *Epilobium roseum*, which is already excluded. Nowadays, long-distance dispersal of seeds by humans and their vehicles is always a possibility, but there has to be a suitable habitat to disperse to and, in practice, that means the man-made habitats discussed above, which suit only a few R&S species.

In advocating the use of R&S populations to study change in the flora, I am not suggesting that all populations of all species are equally at risk. Small populations are more at risk than large ones. What distinguishes R&S populations is that there is often only one 100m scale unit at a 1km scale site where the species is present. It is where this is the case that most of the losses occur. More widespread species, such as *Campanula rotundifolia* (Harebell) and *Briza media* (Quaking-grass), are typically present in several or many 100m units at a 1km scale site. Even if the 100m scale units of these species are lost at the same rate as those of the R&S species there will be very many fewer losses at 1km scale. So, although the analysis of R&S species is carried out at 1km scale, it is much closer to reporting trends at 100m scale. I suggest that this makes it invaluable in demonstrating the insidious degradation of habitats that many of us are so conscious of. At 100m scale, trends may be similar for a large proportion of the flora, not just for R&S species, giving the results much wider relevance.

V.c. extinctions

Plantlife has annoyed me by publishing in its recent report 'Our vanishing flora' a statement that Berwickshire has lost 0.79 species a year during the twentieth century (Anon, 2013). My estimate is 0.26 species a year, just one third of its claim. Plantlife has declined to offer an explanation. Over two centuries, 49 native species have been lost from Berwickshire, 8% of the flora. That is bad enough.

In the table above I compare the habitats of the extinctions with the total R&S species. About one quarter of the R&S species are now extinct and in general these are spread over habitats more or less in proportion to the R&S species. There are two exceptions. The coast has few extinctions and the aquatic habitat has many. Further analysis, not presented here, demonstrates that R&S populations on the coast are indeed being lost very much less frequently than those of other habitats. This is not at all unexpected, as Berwickshire's coastal strip is much better preserved than any other habitat in the v.c. So the v.c. extinctions and the population losses are telling the same story, except for the aquatic species.

The high number of aquatic species extinctions relates disproportionately to species, such as *Utricularia* spp. (Bladderworts), that survived in drainage ditches after the larger

wetlands were drained, but have been lost to eutrophication in the last 60 years. The population analysis suggests that aquatic species have had rather similar losses to those of other broad habitats (other than the coast), subject to the difficulties relating to their population statistics discussed above, which have led to the exclusion of quite a number of species. So it is surprising to have this evidence that the exclusions may, if anything, have led to an understatement of losses rather than the reverse.

Conclusions

I suggest that this discussion has indicated that the goal of chronicling the decline in the native flora is indeed furthered by the concept of analysing the decline in the populations of R&S species in a vice-county at 1km scale and that other vice-counties could usefully adopt this approach. The broad habitats for which this methodology is most likely to yield representative statistics of loss are coast, grassland, moorland, wetland and woodland, while accepting the consequences of excluding the few mobile species with possible gains. Statistics for the aquatic habitat need interpreting with care in view of the opportunities for colonisation. Small samples are likely to limit the value of the approach for riverside and rock habitats. The approach is not helpful for arable and ruderal habitats.

References:

ANON (2013). *Our vanishing flora: how wildflowers are disappearing across Britain*. Plantlife, London.

BRAITHWAITE, M.E., ELLIS, R.W. & PRESTON, C.D. (2006). *Change in the British flora 1987 – 2004*. Botanical Society of the British Isles, London.

BRAITHWAITE, M.E. (2010). 'Berwickshire's disappearing scarce plants'. *Watsonia*, **28**: 129-140.

MARREN, P. (2000) *Where have all the flowers gone? A study of local extinctions as recorded in the county floras*. Plantlife, London.

PRESTON, C.D. (2000). 'Engulfed by suburbia or destroyed by the plough: the ecology of extinction in Middlesex and Cambridgeshire'. *Watsonia*, **23**: 59-81.

WALKER, K.J. (2003). 'One species lost every year? An evaluation of plant extinctions in selected British vice-counties since 1900'. *Watsonia*, **24**: 359-374.

Will *Frankenia* be the next *Cochlearia danica*?

NORMAN A. THOMPSON, *6 The Grove, Marton, Middlesborough, Cleveland, TS7 8AA*

John Walton, in *BSBI News*, **122**, reported the finding of *Frankenia laevis* (Sea-heath) at the edge of a minor road in Warwiickshire. Bill Thompson found *Frankenia* in, I think, 2009, growing on the kerb-side of the main road between Helmsley and Kirbymoorside, North Yorkshire. Vincent Jones, our Recorder, informed our Cleveland Naturalists' Club of the discovery, and I went to photograph it in July of that year (see photo inside back cover).

The *New atlas* shows the preferred habitat of the plant to be along the coast-line of south-east England. It looks as though the plant has started to move out along the salted margins of our roads. The plants that I saw were intermittently spread along about 50 yards of the kerb, but how did they get there? So far as I know, no other patches have been found. It appears that the plant is spreading out, but at a much slower rate than *Cochlearia danica* (Danish Scurvy-grass).

Another interesting discovery was *Daboecia cantabrica* (St Dabeoc's Heath), a western Irish plant, which was found by Burrow and Gibson in 2005. The patch was only about 4½ miles from the *Frankenia*, but this time in a heather moor. It is extraordinary that two plants have been found hundreds of miles from their original sites, but growing so near to each other.

At long last: the buried story behind the collapse of the BSBI's semi-ancestor

DAVID ALLEN, Lesney Cottage, Middle Road, Winchester, Hampshire, SO22 5EJ

The BSBI is the lineal descendant of one component of an awkwardly dual body, the Botanical Society of London, that managed to flourish reasonably successfully for two decades before collapsing, abruptly and mysteriously, in 1856. It had tried to meet the needs of two disparate constituencies by serving, on the one hand, as a medium for postal mass-exchange of herbarium specimens and, on the other, as a kind of mechanics' institute for residents in the London area with an interest in botany, which did not necessarily extend to collecting. Combining those activities proved increasingly difficult to sustain, however, for collectors in the provinces resented most of the annual subscription being expended on a headquarters facility that they were unable to make use of other than minimally. An outright split had started to loom, when it belatedly came to light that the long-serving honorary secretary, George Edgar Dennes, had latterly been neglecting his duties sufficiently drastically to plunge the Society into administrative chaos and a debt so deep that there was no alternative but to wind itself up and auction its possessions. A nucleus of the specimen exchangers, however, refused to accept that London disembodiment necessitated the termination of the postal activity, and proceeded to continue that on a smaller, more discriminating scale for what would turn out to be almost a century longer.

When the BSBI's history came to be reconstructed on the occasion of what it felt justified in treating as its sesquicentenary, it proved next to impossible to penetrate the veil of embarrassed silence firmly drawn at the time over precisely how that long-ago débâcle had come about (Allen, 1986). James Britten, the long-time editor of the *Journal of Botany*, had made an attempt to do that many years later, but came up with nothing more than a lingering rumour that Dennes had subsequently emigrated to Australia. That possible lead nagged me sufficiently to try to interest some botanical historian 'down under' in pursuing matters further in archives there (Allen, 1979). Disappointingly, though, more than thirty years went by before that tempting morsel of mine eventually attracted a bite. Ironically, this was from an Australian living over here, Professor Arthur Lucas, the authority on that country's outstanding botanical pioneer, Ferdinand von Mueller. Enviably well-versed in the great new opportunities for biographical research meanwhile opened up by the Worldwide Web, Professor Lucas (2011, 2012) has at last been able to piece together, in most impressive detail, that tantalisingly missing tail-end to the story of the Botanical Society of London's fate. What follows is a necessarily very condensed account of what he has unearthed.

Close scrutiny of that Society's one surviving minute-book had already brought to light a marked deterioration in quality, beginning in 1848. That year, the minutes become "noticeably more perfunctory, more illegible, and more prone to slips" (Allen, 1986: 57). From what Professor Lucas's research now reveals, it could well be no coincidence that that was a year memorable for outbreaks of severe political unrest across much of Europe. Long radically-inclined, Dennes was seemingly stirred by those into becoming active in the National Reform Association, a body energetically seeking ways and means of increasing the Liberal vote. This led to his extending his long-standing work as a solicitor to the hectic periodic spells involved in acting for candidates in Parliamentary elections. He topped that in 1851 by joining the London Reform Club. Marriage followed two years after that, and fatherhood soon as well.

Something had to be shed if Dennes was to cope with that rush of extra commitments. As his legal practice was presumably his main source of income and underpinned his standing in the world of Radical politics, resigning the secretaryship of the Botanical Society would

have been the obvious solution. But Dennes had for so long poured creative energy into building this other outlet for his radical convictions that he evidently could not bring himself to relinquish the central role the holding of that office ensured for him.

The lurch into inefficiency that the Society's minute-book indicates was not the only consequence of Dennes' increasing distraction in other directions. Potentially more worrying was the extent to which (as Watson later confided in a letter to Babington) he "usurped the functions of the Treasurer" – words which seem to imply that he took to handling money without the requisite authorised delegation, conduct hardly to be expected of a solicitor. Had anyone at that stage realised into what deep water Dennes' personal finances were plunging, alarm bells would surely have rung. However, it was not until 1856 that the severity of the straits he was in became public knowledge, when he was sued in the courts for the return of a sizeable sum entrusted to him to cover the expenses incurred by a fellow Radical in contesting a Parliamentary seat. Only desperation could have made Dennes ill-advised enough to risk ruin by putting forward in his defence an argument that looked shakily far-fetched. He ended up forfeiting not just the sum at issue but also his professional reputation, and, with that, the ability to continue in practice, at any rate anywhere where he was known.

Bereft of his livelihood and allegedly reduced (in Watson's words) to a "starving condition", he was saved from destitution by the residual goodwill of Botanical Society members, who made over to him the amount remaining from the selling off of its possessions. That was, luckily, enough to enable him to start afresh in some other part of the world, preferably one in which his knowledge of English law was a marketable asset. It was, accordingly, in western-most Canada, practising as an attorney in what was then the Vancouver Island Colony, that he turns out to have broken surface again, early in 1860. For five years, things seemingly went well for him there, so much so that he was elected to the Colony's House of Assembly, in which he lost no time in proposing revisions to its existing law relating to debt. But, all too soon, that new life ended no less ignominiously than the one before. Having over-reached himself financially once again, he was declared bankrupt and barred from practice as a result, the very first lawyer there to suffer that fate.

After returning to London via New York, Dennes then decided to try his luck in Australia (so the rumour that Britten picked up to that effect turns out to have been true). The three months' voyage took him to Melbourne in June 1867, and within a year he was endeavouring to build a practice as a lawyer there instead. By then, though, his health had begun to give way under the continual strain, and, after intermittent breakdowns, he was admitted to an asylum, where he died two months later, in March 1871, "of disease of the brain and lungs". He was just 54. His wife and son, who had seemingly remained in London throughout, both outlived him by more than thirty years. No evidence has been uncovered that Dennes turned again to studying botany in either Canada or Australia.

References:

ALLEN, D.E. (1979). 'British botanists in Australia'. *Newsletter, Society for the Bibliography of Natural History*, ser. 2, **1**: 7-8.

ALLEN, D.E. (1986). *The botanists*. Botanical Society of the British Isles, London.

LUCAS, A.M. (2011). 'Sequels and solutions: members of the Botanical Society of London in Australia'. *Newsletter, Society for the Bibliography of Natural History*, ser. 2. **102**: 5-6.

LUCAS, A.M. (2012). 'George Edgar Dennes (1817-1871): life after the Botanical Society of London'. *Archives of Natural History*, **39**: 157-161.

April-fooled by pink Primroses: the case of the 'ergastofigofyt'

THOMAS MCCLOUGHLIN, St Patrick's College (a college of Dublin City University), Ireland; (thomas.mccloughlin@spd.dcu.ie)
ZDENKA CHOCHOLOUŠKOVÁ, University of Western Bohemia, Pilsen, Czech Republic

Primula vulgaris (syn. *P. acaulis* (L.) Hill) (Primrose) is a species of the genus *Primula* native to western and southern Europe (from the Faroes and Norway south to Portugal and east to Germany, Ukraine, the Crimea and the Balkans, Algeria, and south-west Asia (Turkey, east to Persia) (*Flora Europaea*, USDA). It is also a much-loved spring flower. According to Huxley (1992), there are three subspecies:

Primula vulgaris ssp. *vulgaris*. Western and southern Europe, as described above; flowers pale yellow.

Primula vulgaris ssp. *balearica* (Willk.) W.W.Sm. & Forrest. The Balaerics, where they are endemic; flowers white; leaf stem longer than leaf blade.

Primula vulgaris ssp. *sibthorpii* (Hoffmanns.) W.W.Sm. & Forrest. Balkans, southwest Asia; flowers pink to red or purple.

Numerous cultivars have been selected for garden planting, often derived from ssp. *sibthorpii* or hybrids between the subspecies. These and other garden hybrids are available in a wide range of colours and have an extended flowering season (Huxley, 1992). Pink and red flowered Primroses growing in natural conditions in western Europe are usually naturalised from garden escapes (Blamey & Grey-Wilson, 1989), although a pink-flowered form is reported locally as a wild plant in Wales (Clapham, Tutin & Warburg, 1962).

The discovery of a pink-flowered Primrose (*Primula vulgaris* (syn. *P. acaulis* (L.) Hill)) by a child led the author (TMcC) to investigate the matter further. Initially, a naïve reading and understanding of floras led the child to think that he had found a specimen of *Primula vulgaris* ssp. *sibthorphii* (Fig. 1, Colour Section, Plate 4.).

However, this was soon dispelled by the first contact with the BSBI. Not really thinking much more about it for some time, the child, as he matured, continued to find examples of pink Primroses. Typically, an individual set in a drift of *Primula vulgaris* (syn. *P. acaulis*) (Fig. 2, Colour Section, Plate 4.), appeared in a number of locations, indicating that the phenomenon appeared to be quite frequent (Table 1, p. 53). This occurrence of 'pink Primroses' was often thought to be merely a 'garden escape', where garden varieties were physically disposed of in hedgerows. However, there are other options which are a little more sophisticated. There are two possible explanations for the occurrence of pink Primroses:

Pollen from *Primula* ×*polyanthus* L. (Polyanthus) has found its way to *P. vulgaris* L. flowers, and seeds have produced a new hybrid. This needs to be confirmed by genetic studies. This seems more likely in the case of the polyanthus-like pink Primrose.

Seeds from *Primula* ×*polyanthus* have found their way to sites occupied by *P. vulgaris*.

To choose between these two hypotheses, we have to note the numbers of specimens of pink Primroses found, which is also a key factor in saying why the specimen first noted by the boy was not *P. vulgaris* ssp. *sibthorpii* (Hoffmann). For the 'pink Primrose' to be the subspecies, there would not be merely a single specimen within a drift of *P. vulgaris* L. We must note that the specimens found in Co. Westmeath appear to occur in a small drift, so that we might conclude that the seed hypothesis is reasonable here. However, in the case of *vulgaris*-like pink Primroses, it may be an issue of stray pollen giving rise to one seed of the new pink hybrid.

Structural variation

'Pink Primroses', as they are found, fall into two categories: (i) *vulgaris*-like, single inflorescences (Fig. 3, see p. 52) and (ii) *polyanthus*-like, multiple-flowered inflorescences (Fig. 4, Colour Section, Plate 4.). Apart from the obvious difference of colour in the *vulgaris*-like pink Primroses, the pink forms are identical to the 'normal' *P. vulgaris* L., and we note especially there is no difference in colour of the centre of each flower.

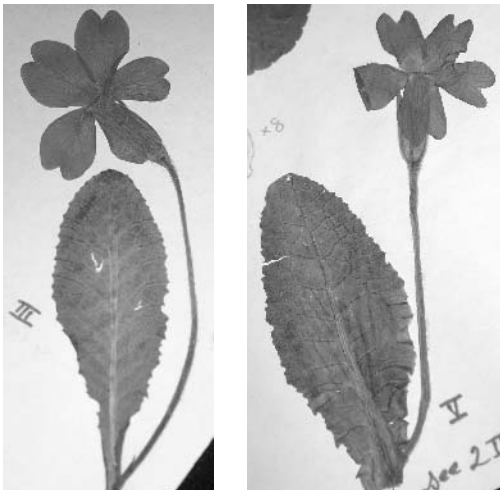


Figure 3. Two herbarium voucher specimens of *vulgaris*-like pink Primroses. Photo T.J. McCloughlin © 2012

For situations like this, we often use the term 'garden escape' (a plant that came originally from the garden), although we often think of this as a plant grown in a garden and either accidentally or deliberately discarded in nature and which spreads in its new ecosystem. In the case of the pink Primrose, we cannot see that the term 'alien' (a non-native species) nor 'adventure-species' (a species that spreads easily) applies, since the pink Primrose is not a true species. It is possible that a plant may be all three: a garden escape, an alien and adventure-species (*e.g.*, *Rheum officinale*, Lepsi *et al*., 2006), but also something different altogether.

Garden species may 'escape' as seeds and as pollen. If they escape as seeds, then the resulting plant is obviously the same as the parent and no 'hybridisation' (to use the term in its very general sense) has taken place. The pollination of flowers of native species involving pollen of cultivars or other genetically modified species represents a cause for concern for naturalists, since, should the incidence of, say, pink Primroses increase throughout the range of *P. vulgaris* L., this would pose a threat to the native species. Thus far, the incidence of pink Primroses is sporadic and occasional. Pink Primroses do not appear on their own – and so the possibility of establishing homogeneous populations is not yet likely. However, study of this possibility needs to be undertaken.

In the Czech Republic, the Czech technical term 'ergastofigofyt' is used to describe a type of 'garden escape' such as those we have described, and we believe that an anglicised version ('ergastofigophyte' or similar) of this term would be appropriate to describe the pink Primrose, since 'garden escape' appears to be too general and not to be a scientific term at all.

Further analysis:

Photographs of the specimens were analysed for the colour of the specimen. Whereas this might seem a simple enough operation, photographs do not often 'capture' the colour of the petals, because light quality and shadow impinges on the colour as it is represented in the photograph. Therefore, a judgement has to be made as to the 'real' colour of the petals. DigitalColor Meter (version 3.7.2), a utility on Apple laptops, uses the cursor as a virtual light meter aperture, through which to record the RGB colour as an 8-bit 'actual' colour. To mitigate the problem of shading, the aperture size was maximised, while the photo size was reduced, thus the aperture of the light metre took in as much of the flower petal as possible. The 8-bit RGB was recorded for each of the ten specimens in Table 1. The 'type' of 'pink Primrose' was coded as '1' for the '*vulgaris* type', and '2' for '*polyanthus* type'. Thus, four columns of integers were produced. It would be possible for the locations to represent grid references and two further coloumns to be added, taking account of longitude and latitude, but a small sample of 10 specimens less than 200 miles apart is less useful. The resulting matrix of 4×10 columns was subjected to multidimensional scaling (ASCAL) using PASW (SPSS) 18, producing the plot in Fig. 5 (p. 54). In this, 'var1', which is the *P. vulgaris* subspecies, appears as an outlier, whilst the rest of the sample form two distinct clusters (cluster 'A' on the right hand side: 'var5', 'var7', 'var8', 'var9' and 'var10'; and cluster 'B' on the left hand side: 'var2', 'var3', 'var4' and 'var6'). Both clusters are fairly dispersed and it is not clear why there are two clusters. In cluster 'B', which is very dispersed, it might be argued reasonably that 'var3' and 'var6' are in fact outliers and not part of the cluster at all. However, all the hybrids appear below the x axis. Caution needs to be exhibited however when looking at the location of clusters with respect to quadrants on a Cartesian plane. In MDS, the axes

Table 1. Table of locations, colour and other descriptive data

Specimen/ "var" (variable) number	Location / fieldnotes	Type *vulgaris* = 1 *polyanthus* = 2	Colour: RGB 8-bit		
			R	G	B
1. *P. vulgaris* ssp. *sibthorpii*	National Botanic Gardens, Glasnevin	1	217	133	247
2. Pink Primrose	Taughman, Co. Westmeath	2	207	147	170
3. Pink Primrose	Lurganbrae, Co. Fermanagh	1	208	153	138
4. Pink Primrose	1 small specimen in a drift at old railway halt of Clogher Valley Railway north of Clogher, Co. Tyrone	1	213	148	171
5. Pink Primrose	Terrew B, Co. Tyrone (garden)	1	244	199	234
6. Pink Primrose	At Esso garage south of Bantry on N81	1	179	132	161
7. Pink Primrose	1 mile west of Dunmanway on R586 (specimens appear to have been collected togther at a house)	1	243	203	232
8. Pink Primrose	19km from Clonakilty, after Cotter's Pub on R599	1	224	178	208
9. Pink Primrose	Halfway between Clonakilty and Rosscarbery at staggered crossroads before turn at Owen (in a grouped line) on N71	1	228	185	213
10. Pink Primrose	One small specimen at the gate just south of Ballingurteen on R599	1	232	199	233

have little significance, since the plot represents the calculated relative distance between each case in the sample. However, the plot demonstrates the range of colour shade of the hybrids and how the genuine subspecies is isolated from the hybrids, having a stronger 'blue' component to its colour.

Conclusion

'Pink' Primroses appear as isolated individuals or strong components in drifts of wild-type *P. vulgaris*. Their presence, which is throughout the island of Ireland, has an undetermined frequency and their cause remains unknown, but two forms of hybridisation seem likely (reflected in the structural differences in the pink forms), and others are possible. Ultimately, genetics will provide the answers, and such work is needed as well as an investigation as to whether the natural populations of the wild type are in any way under threat. The pink forms might form the basis of new horticultural forms, as they appear to be as robust as the wild types and yet have attractive floral varieties (though much more restrained than their *polyanthus* cousins). Further analysis of the visual attributes suggests that the pink Primrose is not related to the naturally occur-

ring subspecies of *P. vulgaris* (ssp. *sibthorpii*) by colour analysis, and that the two structural forms can be observed easily in a distance metric such as MDS. One issue about using the colour analysis is that photography is somewhat unreliable as a colour capture if the camera and lighting conditions are radically different, but it does provide a rough but simple way to analyse colour.

References:

BLAMEY, M. & GREY-WILSON, C. (1989). *The illustrated flora of Britain and northern Europe*. Hodder & Stoughton, London.

CLAPHAM, A., TUTIN, T., & WARBURG, E. (1962). *Flora of the Brish Isles* Cambridge University Press, Cambridge.

CLEMENT, E.J. & FOSTER, M.C. (1994) *Alien plants of the British Isles*. Botanical Society of the British Isles, London.

HUXLEY, A, (ed.) (1992). *New RHS dictionary of gardening*. Macmillan, London.

LEPSI, M.; BOUBLÍK, K.; LEPSI, P.; & OPLETAL, L. (2006). 'Reven Lékarská (*Rheum officinale*) – novy adventivní druh ve strední Evrope'. *Zprávy Ces. Bot. Spolec.,* Praha **41**: 161 – 171.

USDA, ARS, National Genetic Resources Program.

Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?29712 . (Accessed 9th September 2011)

Flora Europaea Search Results [Online Database]. Royal Botanic Garden, Edinburgh. URL: http://rbg-web2.rbge.org.uk/cgi-bin/nph-readbtree.pl/feout?FAMILY_XREF=&GENUS_XREF=Primula+&SPECIES_XREF=vulgaris&TAXON_NAME_XREF=&RANK= (Accessed 9th September 2011)

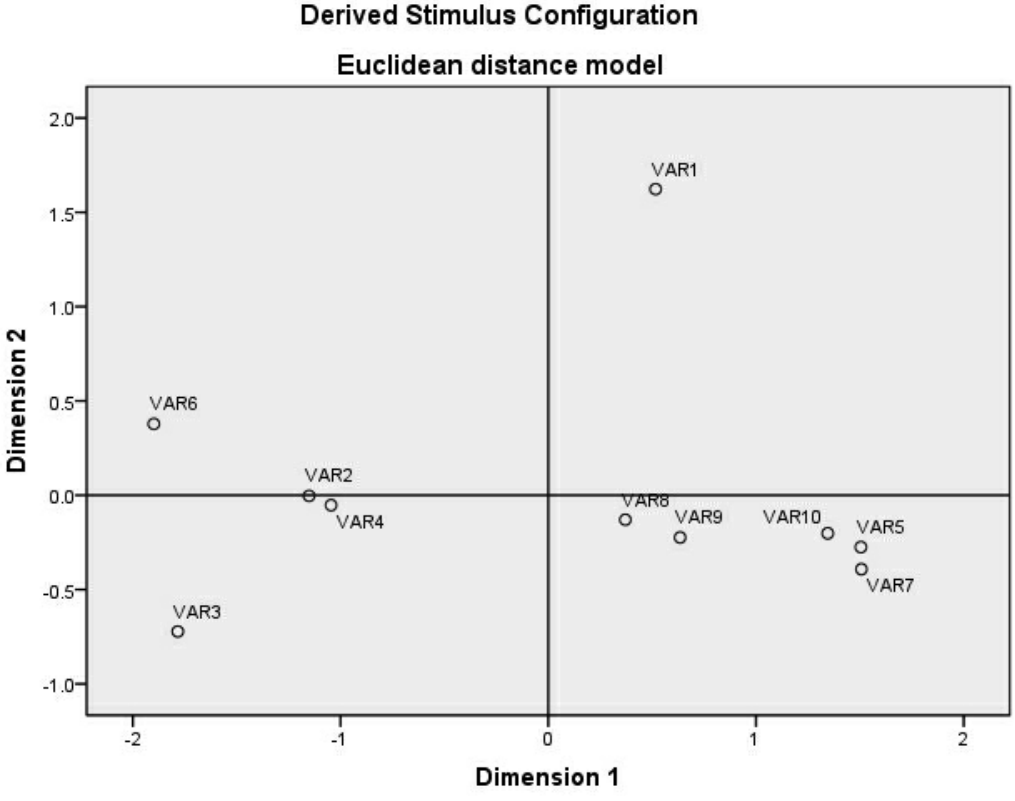


Figure 5. MDS (ASCAL) plot of the numerical data from the 10 specimens in Table 1.

Changing status and ecology of *Blysmus rufus* (Saltmarsh Flat-sedge) in South Lancashire (v.c.59)

PHILIP H. SMITH, *9 Hayward Court, Watchyard Lane, Formby, Liverpool L37 3QP*; (philsmith1941@tiscali.co.uk)

Introduction

Blysmus rufus (Saltmarsh Flat-sedge) is a rhizomatous, perennial herb found on upper salt-marshes, especially in depressions or runnels, but also in brackish ditches and dune-slacks, where it usually forms a short-turf community. It can also occur on rocky shores in freshwater seepages or besides streams running onto beaches. The plant is locally frequent on the coasts of England and Wales, south to Lincolnshire and Glamorgan. In Ireland, it is scattered around the north coast, but is rare in the Republic. *B. rufus* is most common in western Scotland, often extending inland. Here, occurrences are usually in grazed salt-marshes, but small stands can be found in rocky flushes in the transition between salt-marsh and mire, on raised beaches and among coastal rocks. This species has a European Boreal-Montane distribution, but is also found in Central Asia and North America and is one of the few northern components of the British salt-marsh community (Foley & Porter, 2002; Jermy, *et al*., 2007; Rodwell, 2000).

Ellenberg's indicator values (Hill *et al*., 2004) show that *B. rufus* is light-loving (L = 8), associated with constantly moist to wet soils (F = 8) that are weakly acid to weakly basic (R = 7) and rather infertile (N = 4), and that it is adapted to moderately high salinity (S = 5).

Foley & Porter (2002) gave a change index of -0.53, pointing out that most losses around Irish Sea coasts and eastern Scotland took place before 1930 and that the distribution of *B. rufus* now appears largely stable. They mapped a total of 441 hectads for this species in Britain and Ireland, while the most recent BSBI Maps Scheme (www.bsbi.org.uk, 2012) shows occurrences in 464 hectads. This modest increase seems to represent infilling within the existing range rather than any change in geographical spread.

Occurrence in v.c.59

B. rufus seems always to have been quite localised on the coasts of South Lancashire (v.c. 59). The *New flora of South Lancashire* database (2012 archive version) has 22 records in the 19th century, the earliest being for 1802 by J. Shepherd in a Rabbit-warren between Bootle and Crosby (D.P. Earl *in litt*., 2012). Hall (1838) reported it as occurring near Rimrose Bridge, between Bootle and Crosby and as "abundant in some marshy ground at Bootle, beyond the landmark". Dickinson (1851) mentioned the same localities, both now having long been built up. By the early 20th century the plant was rare in marshes near the coast, Green (1933) citing Dungeon (near Hale), Churchtown and near the bridge to Altcar Rifle Range; these being on the Mersey, Ribble and Alt Estuaries respectively. Thirty years later, Savidge *et al*. (1963) also described the plant as being rare in salt-marshes, adding Birkdale to the sites given in earlier floras.

My first encounter with *B. rufus* was on 4th July 1980 when I photographed two adjacent patches, each about 3m across, at Southport Esplanade (SD324171), in a brackish marsh created by a reclamation embankment built a few years earlier. Associated vascular plants included *Bolboschoenus maritimus* (Sea Club-rush), *Centaurium pulchellum* (Lesser Centaury) and *Cotula coronopifolia* (Buttonweed). By June 1981, the patches had merged and grown to produce a colony about 9m in diameter. Unfortunately, despite attempts to protect the site, it was destroyed in 1986 during the construction of a 'park and ride' carpark. The only other v.c.59 record of *B. rufus* that I am aware of from this period was a patch photographed in July 1987 by R.A. Hall (*in litt*., 1987) at the northern end of slack no. 26 in the Birkdale Sandhills Local Nature Reserve (SD314154). Subsequent searches failed to re-discover this colony, and

the species was then presumed extinct in the vice-county, the Mersey, Alt and Ribble Estuaries having produced no recent records. Reflecting the plant's scarcity, it was listed as a Species of Conservation Importance in North West England by the Regional Biodiversity Steering Group (1999). However, Greenwood (2012) stated that this species seems to have become more widespread in North Lancashire (mainly v.c.60) since the early 20th century. He mapped its presence in 14 coastal tetrads between the north Ribble Estuary and the eastern part of Morecambe Bay.

From 1986 onwards, the development of "Birkdale Green Beach" as a mosaic of embryo dune, salt-marsh, dune-slack, swamp and wet woodland habitats on the foreshore between Birkdale and Ainsdale on the north Sefton Coast (Smith, 2007) provided another potential habitat for *B. rufus*. However, despite repeated searches, this taxon was not encountered until 24th June 2006, when a BSBI field meeting found a large patch about 5m in diameter on upper salt-marsh at SD320152 (Earl & Smith, 2007). Four days later, I discovered a second patch about 150m to the south. Two more were recorded in 2009, four in 2010, and six in 2011, so it was clear that *B. rufus* was spreading along the Green Beach (see Colour Section, Plate 1). A more detailed survey of its only locality in the vice-county was therefore considered justified and this took place in summer 2012.

Methods

By 2012, Birkdale Green Beach was about 4km long and covered over 50ha. From June to early September 2012, this area was systematically searched for *B. rufus*, including revisiting the sites located in earlier years. In most cases, the plant occurred in dense patches, its recognition being greatly assisted by the characteristic dark bluish-green colouration of the stems, which could often be spotted from a distance of several metres. The grid reference of each patch was determined to ten figures using a hand-held GPS device, its dimensions being measured by pacing. For patches that were sufficiently large, a representative sample of vegetation was recorded in a 2m × 2m quadrat, using National Vegetation Classification (NVC) methodology (Rodwell, 2000). These were analysed using a modified TABLEFIT programme to determine the degree of fit to known NVC communities (Hill, 1996). Vegetation stand heights were measured, while notes were taken on habitat condition, including such factors as the presence of human trampling and Rabbit grazing.

Results

Twenty-nine patches of *B. rufus* were recorded, covering a total area of 680m^2 (mean area 23.5m^2, range 0.4 – 99m^2). They were distributed along most of the length of the Green Beach between Ainsdale and Birkdale, from SD32031657 in the north to SD30291393 in the south, a linear distance of 3.16km, though with some indication of clustering in the central section (Fig. 1, p. 63). The species occurred in four tetrads in one hectad (SD31B, C, D and I).

Twenty quadrats were recorded, these containing 47 vascular associates of *B. rufus* (Table 1. p. 60.). The most ubiquitous, with a presence in at least 10 of the 20 quadrats, were: *Agrostis stolonifera* (Creeping Bent) (10 occurrences), *Bolboschoenus maritimus* (17), *Carex extensa* (Long-bracted Sedge) (11), *Festuca rubra* (Red Fescue) (12), *Glaux maritima* (Sea Milkwort) (17), *Samolus valerandi* (Brookweed) (11), *Trifolium fragiferum* (Strawberry Clover) (14) and *Triglochin maritima* (Sea Arrowgrass) (15). Less frequent were: *Juncus maritimus* (Sea Rush) (6), *Oenanthe lachenalii* (Parsley Water-dropwort) (5) and *Plantago maritima* (Sea Plantain) (6).

Despite the apparent richness of associates, the vegetation supporting *B. rufus* was relatively species-poor, with a mean of only 10 taxa per quadrat (range 5–17). Stand heights varied from 25 to 75cm, with a mean of 48cm.

The mean Ellenberg S value for the vascular associates is 1.7 (range 0–7) but that for ubiquitous and frequent taxa (see above) is 3.2 (range 1–5), rather closer to the S value of 5 for *B. rufus* itself.

B. rufus patches occurred in pans or depressions in the ground surface at 11 sites (38%), 21 (72%) of the locations were characterised

as upper salt-marsh, while three (10%) were associated with slack/fen vegetation. Eleven (38%) of patches were found within or on the edge of dense *B. maritimus* swamp, while seven (24%) were linked to trampled footpaths and three (10%) were in sites grazed by Rabbits. Due to the exceptionally wet summer, most *B. rufus* sites were flooded by freshwater.

Reference to keys, data tables and community descriptions in Rodwell (2000) suggests that most samples are close to SM19: *Blysmus rufus* salt-marsh. TABLEFIT analysis shows that 14 of the 20 samples do indeed accord with SM19, the level of fit varying from very poor to fair (Table 2, p.). Rodwell described this community as a species-poor association of upper salt-marsh and pans, generally dominated by *B. rufus* but often with abundant *Agrostis stolonifera*, *Glaux maritima* and *Juncus gerardii* (Saltmarsh Rush). Also frequent but in lesser quantity are *Triglochin maritima*, *Festuca rubra*, *Plantago maritima* and *Carex extensa*. Three samples from the northern part of the Green Beach are closer to SM16d: *Festuca rubra* saltmarsh, *Leontodon* [*Scorzoneroides*] *autumnalis* sub-community, though at poor to very poor levels of fit. The latter community is particularly characteristic of the mid and upper salt-marsh, especially in the north and west of Britain, and is often grazed, the *Leontodon* sub-community occurring at the higher levels (Rodwell, 2000). Three samples recorded in the southern Green Beach more closely resemble swamp and dune-slack communities, specifically S21: *Scirpus* [*Bolboschoenus*] *maritimus* swamp, S12c: *Typha latifolia* swamp, *Alisma plantago-aquatica* sub-community and SD15d: *Salix repens-Calliergon cuspidatum* [= *Calliergonella cuspidata*] dune-slack, *Holcus lanatus-Angelica sylvestris* sub-community, all showing very poor levels of fit. These communities reflect increasing freshwater influence, S21 being typical of ill-drained brackish sites on or near the coast, including upper salt-marshes, while S12c occurs rarely on salt-marshes, being most characteristic of standing or slow-moving mesotrophic to eutrophic, circum-neutral to basic freshwaters. The *Alisma* sub-community seems to be mostly found in shallow waters that do not show wide annual fluctuations (Rodwell, 1995). SD15d is associated with dune slacks that are kept very wet by prolonged flooding with circum-neutral ground-water, the *Holcus-Angelica* sub-community implying moderate nutrient enrichment (Rodwell, 2000).

Table 3 (p. 63) shows further TABLEFIT analysis of the samples grouped into fours from north to south. Now, all five groups show accordance with SM19, but levels of fit have hardly improved, again ranging from very poor to fair, at best, in the central section. As before, the worst fits are in the southern section of the study area.

Discussion

Habitat considered suitable for *B. rufus* began to form on Birkdale Green Beach in 1986, but, despite careful searching, the plant was not located until 20 years later. The relatively large nuts, 3–4.5mm × 1.5–1.6mm (Jermy *et al*., 2007) and the preferred habitat suggest that the sea may play an important role in dispersal of this species. The possibility of seeds being carried in the guts of the abundant migratory waterfowl that occur on the adjacent Ribble Estuary cannot be ruled out, but opinions vary on the importance of this method for aquatic plant dispersal (Brochet *et al*., 2009; Clausen *et al*., 2002).

The delay in the arrival of *B. rufus* on the Green Beach may relate, in part, to the distance from a suitable source of propagules, the nearest tetrad record (SD42D) being at Warton Bank on the north Ribble Estuary, about 16km to the north-east and largely against prevailing winds and currents (Plater & Grenville, 2010). However, the last sighting at Warton seems to have been over 40 years ago (E.F. Greenwood *in litt*., 2012). Perhaps a more plausible source is the Dee Estuary, about 30km south-west of Birkdale, where *B. rufus* has been recorded in some abundance in recent years (E.F. Greenwood *in litt*., 2012). An alternative is Anglesey, 60km to the south-west across Liverpool Bay, where there are several recent hectad records for *B. rufus* (BSBI maps

scheme, 2012). Smith & Greenwood (2009) argued for Anglesey or North Wales as the origin of *Limonium* spp. (Sea-lavenders) that had recently colonised Marshside salt-marsh on the Ribble Estuary, this site being only about 5km north-east of Birkdale Green Beach.

Once the plant was established on the central Green Beach, its range expanded about 1.4km northwards and 1km to the south, although most patches were found in the central section close to the original 2006 sites (Fig. 1, p. 63). *B. rufus* appeared in discrete patches, each perhaps arising from individual propagules. Patch size may be partly linked to age. Thus, the two patches found in June 2006 increased in area from 25 to 90m^2 (× 3.6) and from 6 to 48m^2 (× 8) over six years. Similar relationships between patch (tussock) age and diameter have been established for brackish-water rushes (*Juncus*) (Rozema, 1979).

Rodwell (2000) described *B. rufus* as occupying a variety of poorly-drained areas or sites subject to flushing by brackish or freshwater, characteristic habitats being small depressions or pans in the upper salt-marsh and sometimes on path edges. These descriptions accord well with this species' locations on Birkdale Green Beach, most being on upper saltmarsh, 38% in pans or depressions and 24% associated with lightly trampled footpaths. Both Rodwell (2000) and Jermy *et al*. (2007) mention a strong association with grazed marshes. However the Green Beach is not grazed by livestock, while Rabbits occur sporadically, only 10% of *B. rufus* patches being in apparently Rabbit-grazed vegetation.

It was expected that most patches would accord with the NVC SM19 community, the ubiquitous associates of *B. rufus* being similar to those listed by Rodwell (2000) for SM19. However, most of the samples show poor or very poor statistical fits to this type, perhaps reflecting the rapid changes taking place in Green Beach vegetation and its relative immaturity.

In 23 samples of SM19, Rodwell gave the mean height as 17cm (range 6–25cm), much lower than measurements made in the current study: mean 48cm (range 25–75cm). This may be due to the relatively low grazing pressure on Birkdale Green Beach.

When *B. rufus* first appeared here, its habitat was occasionally inundated by high spring tides. However, continuing accretion, including the development of embryo dune ridges along the seaward edge of the Green Beach, means that only the northernmost patches are now subject to seawater flooding. To the south, wetland communities have been changing over time from salt-marsh to primary dune-slack and fen (Smith, 2007); this being reflected in the presence of swamp and sand-dune slack communities in the TABLEFIT results for the southern section (Table 2, p. 62).

Ellenberg salinity (S) values for the associates reflect a maritime influence, the mean value of 1.7 being typical of species that occur in both saline and non-saline conditions, but suggesting that salinity is not strongly predominant. However, the mean S value for ubiquitous and frequent associates (3.2) is characteristic of plants that are most common in coastal sites but may also occur regularly in freshwater or non-saline inland soils (Hill *et al*., 2004).

There appear to be few published studies into the ecology of *B. rufus*. Penford (1989) investigated this species in Fife, eastern Scotland (v.c.85), where it occurs in small stands (≤10m^2) in a transition zone between base-rich fen and *Juncus gerardii* – dominated saltmarsh. Associates included *Agrostis stolonifera*, *Eleocharis quinqueflora* (Few-flowered Spike-rush), *Festuca rubra*, *Glaux maritima*, *Plantago maritima*, *Triglochin maritima* and *T. palustris* (Marsh Arrowgrass), most of these also being found with *B. rufus* at Birkdale. He suggested that the plant's restriction to the top of the salt-marsh indicates an obligate halophyte, but one that is unable to tolerate prolonged exposure to strongly saline conditions. Indeed, soil analysis showed that sodium concentration increased sharply immediately seaward of the *B. rufus* stands. Penford also showed that soil calcium levels were highest in the *B. rufus* zone, falling both inland and towards the sea. He pointed out that calcium is known to ameliorate the effects of

salinity at a cellular level, perhaps making it easier for *B. rufus* to grow in saline environments. Furthermore, base-rich flushing, coupled with the well-drained gravelly substrate found in Penford's study area, may further reduce sodium concentration. He also drew attention to the relative abundance of *B. rufus* in high-level salt-marshes of western Scottish sea-lochs, where lower salinity is also a factor. Although soil analysis was not carried out at Birkdale, the sandy substrate here is known to be high in calcium, due to the abundance of shell fragments (Millington *et al*., 2010), while flushing by base-rich freshwater is evident at most of the sites where *B. rufus* was recorded on the Green Beach.

Further insights were gained by Siira (1983), who investigated the occurrence of *B. rufus* in littoral and epilittoral habitats on the north-east coast of the Bothnian Bay, Sweden. Substrates were near neutral (pH 6–7), while the dominant soil electrolyte was chloride. The plant was said to have poor colonisation ability, low competitive potential and narrow ecological amplitude. It disappeared after 1978, having been adversely affected by human activities, such as reduction in livestock grazing and haymaking and changes in drainage.

Siira's finding about the colonising ability of *B. rufus* may help to account for the 20-year delay in its appearance on the Green Beach, though its subsequent increase shows the plant can spread in suitably open coastal habitat once established. The maturation of Green Beach habitats, including changes from upper salt-marsh to dune-slack, the development of stands of tall emergent aquatic vegetation and wet-woodland (Smith, 2007) may eventually restrict opportunities here for *B. rufus*. However, rapid accretion and formation of new salt-marsh vegetation to the south of the present study area and on the southern shores of the nearby Ribble Estuary (Smith & Greenwood, 2009) seem likely to provide additional habitat for this species in the future.

Acknowledgements:
I am grateful to John Dempsey of Sefton Coast & Countryside Service, who transported me to the remotest section of the Green Beach. Richard Burkmar of Merseyside BioBank kindly produced the distribution map. I am also indebted to Pauline Michell for TABLEFIT analyses, while Eric Greenwood and Mike Wilcox provided helpful comments on the manuscript.

References:

BROCHET, A-L., GUILLEMAIN, M., FRITZ, H., GAUTHEIR-CLERC, M. & GREEN, A.J. (2009). 'The role of migratory ducks in the long distance dispersal of native plants and the spread of exotic plants in Europe'. *Ecography* **32**: 919-928.

CLAUSEN, P., NOLET, B.A., FOX, A.D. & KLAASSEN, M. (2002). 'Long distance endozoochorus dispersal of submerged macrophyte seeds by migratory waterbirds in northern Europe – a critical review of possibilities and limitations'. *Acta Oecologica* **23**: 191-203.

DICKINSON, J. (1851). *The flora of Liverpool*. Deighton & Laughton, Liverpool.

EARL, D.P. & SMITH, P.H. (2007). 'Birkdale sand-dunes, Merseyside (v.c.59) 24th June'. Field meeting report. *BSBI News* **104**: 60-61.

FOLEY, M.J.Y. & PORTER, M.S. (2002). '*Blysmus rufus* Saltmarsh Flat-sedge'. In: C.D. PRESTON, D.A. PEARMAN, & T.D. DINES (eds.) *New atlas of the British & Irish flora*. Oxford University Press, Oxford. p. 709

GREENWOOD, E.F. (2012). *Flora of north Lancashire*. Carnegie Publishing, Lancaster.

GREEN, C.T. (1933). *The flora of the Liverpool district*. Buncle & Co., Arbroath.

HALL, T.B. (1838). *The flora of Liverpool.* Whitaker & Co., London.

HILL, M.O. (1996). *TABLEFIT V1.0*, *for identification of vegetation types*. Institute of Terrestrial Ecology, Huntingdon.

HILL, M.O., PRESTON, C.D. & ROY, D.B. (2004). *PLANTATT. Attributes of British and Irish plants*: *status*, *size*, *life history*, *geography and habitats*. Centre for Ecology & Hydrology, Monks Wood, Cambridge.

JERMY, A.C., SIMPSON, D.A., FOLEY, M.J.Y. & PORTER, M.S. (2007). *Sedges of the British Isles*. BSBI Handbook no. 1, 3rd ed.. BSBI, London.

MILLINGTON, J.A., BOOTH, C.A., FULLEN, M.A., TRUEMAN, I.C. & WORSLEY, A.T. (2010). 'Distinguishing dune environments based on topsoil characteristics: a case study on the Sefton Coast'. In: A.T. WORSLEY, G. LYMBERY, V.J.C. HOLDEN & M. NEWTON (eds.) *Sefton's dynamic coast*. Sefton Technical Services Department, Southport. Pp. 116-130.

PENFORD, N. (1989). 'Notes on the ecology of *Blysmus rufus* (Huds.) Link in north-eastern Fife'. *Watsonia* **17**: 360-361.

PLATER, A.J. & GRENVILLE, J. (2010). 'Liverpool Bay: linking the eastern Irish Sea to the Sefton Coast'. In: A.T. WORSLEY, G. LYMBERY, V.J.C. HOLDEN & M. NEWTON (eds.) *Sefton's dynamic coast*. Sefton Technical Services Department, Southport. Pp. 28-54.

REGIONAL BIODIVERSITY STEERING GROUP (1999). *A biodiversity audit of north west England*. 2 vols. Merseyside Environmental Advisory Service, Bootle.

RODWELL, J.S. (ed.) (1995). *British plant communities* Volume 4: *Aquatic communities, swamps and tall-herb fens*. Cambridge University Press, Cambridge.

RODWELL, J.S. (ed.) (2000). *British plant communities* Volume 5: *Maritime communities and vegetation of open habitats*. Cambridge University Press, Cambridge.

ROZEMA, J. (1979). 'Population dynamics and ecophysiological adaptations of some coastal members of the Juncacaeae and Graminae'. In: R.L. JEFFERIES & A.J. DAVY (eds.) *Ecological processes in coastal environments*. Blackwell, London. Pp. 229-241.

SAVIDGE, J.P., HEYWOOD, V.H. & GORDON, V. (eds.) (1963). *Travis's flora of SouthLancashire*. Liverpool Botanical Society, Liverpool.

SIIRA, J. (1983). 'The distribution and ecology of *Blysmus rufus* (Cyperaceae) at Liminka and Oulunsalo on the NE coast of the Bothnian Bay'. *Annales Botanici Fennici* **20**: 269-280.

SMITH, P.H. (2007). 'The Birkdale Green Beach – a sand-dune biodiversity hotspot'. *British Wildlife* **19(1)**: 11-16.

SMITH, P.H. & GREENWOOD, E.F. (2009). 'Colonisation of the Ribble Estuary by Sea-lavenders'. *BSBI News* **111**: 15-20.

Table 1. Occurrences in 20 quadrats and Ellenberg S values of *Blysmus rufus* vascular associates at Birkdale Green Beach

Taxon	**English name**	**Occurrences**	**S value**
Agrostis stolonifera	Creeping Bent	10	1
Alisma plantago-aquatica	Water-plantain	1	0
Angelica sylvestris	Wild Angelica	1	0
Aster tripolium	Sea Aster	4	5
Berula erecta	Lesser Water-parsnip	4	0
Bolboschoenus maritimus	Sea Club-rush	17	4
Cardamine pratensis	Cuckooflower	1	0
Carex arenaria	Sand Sedge	2	1
Carex distans	Distant Sedge	1	3
Carex extensa	Long-bracted Sedge	11	4
Carex hirta	Hairy Sedge	1	0
Carex otrubae	False Fox-sedge	1	2
Centaurium littorale	Seaside Centaury	2	1

Taxon	English name	Occurrences	S value
Cerastium fontanum	Common Mouse-ear	1	0
Eleocharis palustris	Common Spike-rush	3	1
Elytrigia repens	Common Couch	1	2
Epilobium parviflorum	Hoary Willowherb	1	0
Festuca rubra	Red Fescue	12	2
Galium palustre	Marsh Bedstraw	1	0
Glaux maritima	Sea Milkwort	17	4
Hydrocotyle vulgaris	Marsh Pennywort	1	1
Juncus articulatus	Jointed Rush	1	1
Juncus bufonius	Toad Rush	1	1
Juncus gerardii	Saltmarsh Rush	2	3
Juncus inflexus	Hard Rush	2	1
Juncus maritimus	Sea Rush	6	5
Limonium vulgare	Common Sea-lavender	1	6
Mentha aquatica	Water Mint	1	0
Oenanthe crocata	Hemlock Water-dropwort	1	1
Oenanthe lachenalii	Parsley Water-dropwort	5	3
Parapholis strigosa	Sea Hard-grass	1	5
Phragmites australis	Common Reed	5	2
Plantago maritima	Sea Plantain	6	3
Potentilla anserina	Silverweed	1	2
Ranunculus flammula	Lesser Spearwort	1	0
Rumex conglomeratus	Clustered Dock	1	0
Salix cinerea	Grey Willow	2	0
Salix repens	Creeping Willow	2	0
Samolus valerandi	Brookweed	11	3
Schoenoplectus tabernaemontani	Grey Club-rush	1	1
Sonchus arvensis	Perennial Sow-thistle	3	1
Spartina anglica	Common Cord-grass	1	7
Trifolium fragiferum	Strawberry Clover	14	2
Trifolium pratense	Red Clover	2	0
Trifolium repens	White Clover	3	0
Triglochin maritima	Sea Arrowgrass	15	4
Typha latifolia	Bulrush	2	0
Total 47 taxa			

Table 2. *Blysmus rufus* quadrats: summary of TABLEFIT analysis (north to south)

No.	Grid Ref. (SD)	NVC code	Community	Sub-community	Fit	Assessment of fit
27	32020 16596	SM19	*Blysmus rufus* saltmarsh		63	Fair
1	31835 16379	SM19	*Blysmus rufus* saltmarsh		48	Very poor
2	31470 16041	SM19	*Blysmus rufus* saltmarsh		44	Very poor
3	31306 15768	SM16d	*Festuca rubra* saltmarsh	*Leontodon* [= *Scorzoneroides*] *autumnalis*	43	Very poor
4	30986 15236	SM16d	*Festuca rubra* saltmarsh	*Leontodon* [= *Scorzoneroides*] *autumnalis*	51	Poor
5	30961 15174	SM19	*Blysmus rufus* saltmarsh		66	Fair
6	30958 15152	SM19	*Blysmus rufus* saltmarsh		63	Fair
7	30949 15141	SM19	*Blysmus rufus* saltmarsh		60	Fair
8	30942 15120	SM16d	*Festuca rubra* saltmarsh	*Leontodon* [= *Scorzoneroides*] *autumnalis*	55	Poor
9	30883 15087	SM19	*Blysmus rufus* saltmarsh		58	Poor
10	30874 15082	SM19	*Blysmus rufus* saltmarsh		58	Poor
11	30898 15034	SM19	*Blysmus rufus* saltmarsh		54	Poor
12	30827 14904	S21	*Scirpus* [= *Bolboschoenus*] *maritimus* swamp		41	Very poor
24	30763 14848	SM19	*Blysmus rufus* saltmarsh		38	Very poor
19	30626 14568	SM19	*Blysmus rufus* saltmarsh		47	Very poor
20	30585 14534	SM19	*Blysmus rufus* saltmarsh		45	Very poor
21	30536 14449	SM19	*Blysmus rufus* saltmarsh		36	Very poor
22	30504 14380	SM19	*Blysmus rufus* saltmarsh		20	Very poor

No.	Grid Ref. (SD)	NVC code	Community	Sub-community	Fit	Assessment of fit
16	30421 14190	S12c	*Typha latifolia* swamp	*Alisma plantago-aquatica*	15	Very poor
14	30766 13930	SD15d	*Salix repens – Calliergon cuspidatum* [= *Calliergonella cuspidata*] dune-slack	*Holcus lanatus – Angelica sylvestris*	36	Very poor

Table 3. TABLEFIT analysis of 20 quadrats grouped in fours from north to south

No.	NVC code	Community	Fit	Assessment of fit
1	SD19	*Blysmus rufus* saltmarsh	53	Poor
2	SD19	*Blysmus rufus* saltmarsh	64	Fair
3	SD19	*Blysmus rufus* saltmarsh	58	Poor
4	SD19	*Blysmus rufus* saltmarsh	41	Very poor
5	SD19	*Blysmus rufus* saltmarsh	24	Very poor

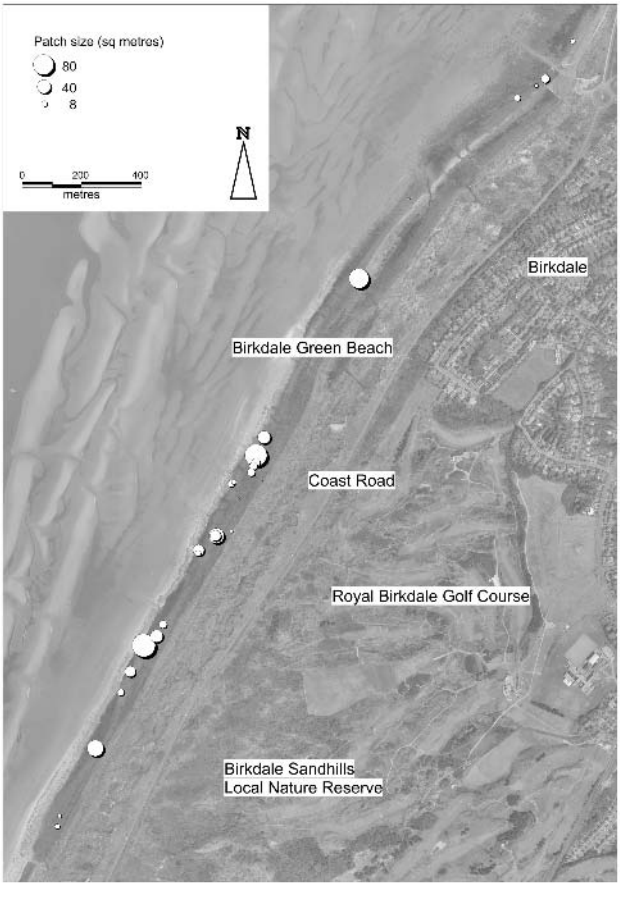


Fig. 1. Distribution of *Blysmus rufus* on Birkdale Green Beach in 2012. Aerial photography by courtesy of Merseyside Environmental Advisory Service.

ALIENS

Malling Toadflax population in Oxfordshire

AMBROISE BAKER, *436 Fulwood Road, Sheffield, S10 3GH*; (ambroise@letterboxes.org);
GEORGINA SOUTHON, *Department of Landscape, University of Sheffield, The Arts Tower, Sheffield, S10 2TN*; (g.southon@sheffield.ac.uk)

So often we start a walk with a heart full of hope – will we see something botanically new to us today?! It so happened that on a warm afternoon last July, with no other intention than to explore some part of Oxford that we did not know well, we found ourselves (after many random back street detours) in the environs of Harpsichord Place, near St Clements. By chance, on top of an old brick wall by the canal, we saw it, and knew immediately that it was a rather unusual finding! A second later, Stace 3 was out of our bag, and a few minutes after that, this little blue-flowered Veronicaceae (ex-Scroph) revealed itself to be *Chaenorhinum origanifolium* (Malling Toadflax), a finding new to Oxfordshire! We are very grateful to both John Killick, vice-county recorded for Oxfordshire and the referee John Akeroyd for having confirmed the identification.

This alien species from the Mediterranean is rarely naturalised in the British Isles but has a stronghold in West Malling in Kent and 22 scattered hectad dots on the BSBI maps. Those scattered records are probably a true reflection of the rarity of the species as a garden escape. In fact its striking appearance cannot be missed or mistaken by anyone having a taste for botanical discoveries. Many questions come to mind with such rare species: how long did it take for this population to reach its current census of 19 flowering plants and 2-4 smaller sterile plants? Did it escape from a garden immediately nearby or were the seeds transported from further away? How long will it survive there? What if the wall is restored? Does it matter if we loose this founder population? Would this not represent tomorrow's biodiversity under a more Mediterranean climate? Anyway enough detours. A specimen is going to be deposited in Oxford University herbarium, in order to document this find, and we truly hope this little population will be surveyed over the coming years.

Pentaglottis sempervirens (Green Alkanet) again

GEORGE BALLANTYNE, *Branksome, 193 Nicol Street, Kirkcaldy, Fife, KY1 1PF*;
(ghballantyne@live.co.uk)

I had expected to find, when looking through *BSBI News*, **122**, some replies to Nick Miller's short piece on the above as an 'invasive alien', and his concern over its spread in southern England. Being (too) familiar with the plant in my own back yard in east central Scotland, he may be interested in hearing a little about it.

In that mine of information, *The Englishman's flora* (Grigson, 1958), Grigson states that "the herbals and older gardening books have nothing to say of its virtues or why it was grown, so that one may conclude it was an old introduction of the Middle Ages, possibly for medicine, possibly for dyeing … the roots certainly give a red dye". Pearman & Preston (2003) reckon it was introduced in 1724, although a Victorian flower book of 1897 includes it very briefly and says it is "a rare native perennial"; however, that author, Edward Step, changed his tune in his popular pocket guide to wild flowers some 30 years later, when, describing the Alkanets, he considered "there are two other species found in this country, but they are not natives, only long established settlers" (Step, 1928). Neither work mentions its invasive tendencies and we have to fast forward to the mid 20th century and the view of Sir E. Salisbury: in his New Naturalist volume. In the chapter on 'garden plants as weeds', he includes it in a list of "garden escapes that have exhibited marked persistence" (Salisbury, 1961). I can vouch for this, having foolishly brought a piece to my garden in the early 1980s. It soon began to spread and in places threatened to take over completely, while it nipped over the wall to the lock-ups next door: the photo (see back cover) demonstrates its ability to thrive in almost any habitat, no matter how difficult, in this case concrete. The roots can be remarkably long and

strong, "about reaching Australia", as Bill Hay found during a 'blitz'on it in his garden in 2012. Like Mr Miller, I also know it dominating an acre of a damp wood, in my instance in north Fife, whence it must have migrated from the neighbouring manse garden. In v.c.85 it was first noted about 1820 at Aberdour Castle (Boswell), where it was seen by Prof. J.H. Balfour in the 1850/60s, and by me in the 1960s–1990s. Many of the Fife & Kinross records are in the grounds or policies of estates, often near old ruins.

This *Pentaglottis* (formerly *Anchusa*) seems to occur in most Scottish vice-counties but I am not aware of its individual role in any other than v.c.85. I expect it may conform to the views put forward by the two vice-county recorders nearest to Scotland, *i.e* Cumbria, where "it was widely cultivated for its medicinal properties, hence its close connection with houses and villages" (Halliday, 1997); and in Northumberland, where "last century it was certainly apparently [a] very uncommon alien, so has evidently spread and increased greatly" (Swan, 1993).

In conclusion, the RHS A-Z dictionary (Brickell, 1996) considers it to be "valued for its flowers, which resemble forget-me-nots" but warns that it "may self-seed freely [and that] the roots are brittle and any piece left in the soil will sprout freely". Additionally, it is very tough: the plant shown in my photo, taken in May 2012, lasted the summer but the dreadful autumn rains and gales then took their toll so that by the end of October it had become a soggy and sorry heap of mush. But on Hogmanay (December 31st) fresh shoots bearing tiny buds of blue could be detected!

So, Nick – the answer to your question appears to be: 'Dig, dig and further dig' if you want to eliminate your problem. It is not called 'evergreen' for nothing!

References:

BOSWELL, E. & M. (1820). 'List of plants growing in the neighbourhood of Balmuto [Fife], 1820'. Ms. in Linnean Soc.Library.

BRICKELL, C. (1996). *RHS A- Z encyclopedia of garden plants*. Dorling Kindersley, London.

GRIGSON, G. (1958). *The Englishman's flora*. Phoenix House, London.

MILLER, N. (2012). 'Invasive alien - *Pentaglottis sempervirens* (Green Alkanet)'. *BSBI News*, **121:** 58.

PEARMAN, D.A. & PRESTON, C.D. (2003). *First records of alien plants in the wild in Britain and Ireland*. BSBI, London.

SALISBURY, SIR E. (1961). *Weeds and aliens*. Collins, London.

STEP, E. (1897). *Favourite flowers of garden and greenhouse*. F. Warne, London.

STEP, E. (1928). *Wayside and woodland blossoms*. New ed. F. Warne, London. Wayside & Woodland Second series.

Pentaglottis sempervirens (Green Alkanet) in Hertfordshire

TREVOR JAMES, *56 Back Street, Ashwell, Baldock, Herts., SG7 5PE*; (trevorjjames@btinternet.com)

George Ballantyne's response (in this issue of *BSBI News*) to Nick Miller's note about *Pentaglottis sempervirens* in *BSBI News*, **121** prompts me to respond from neighbouring Hertfordshire. Data collected for my recently published *Flora*, when analysed, demonstrated an enormous 3118% increase of this species between 1967 and 2009, which was the third largest increase of any species in the survey (the first and second being *Buddleja davidii* (Buddleia) (3291%) and *Cochlearia danica* (Danish Scurvy-grass) (3233%). John Dony, my predecessor vice-county recorder in Herts. (v.c.20) only knew *Pentaglottis* as a persistent plant at a very few places; and it seemed to remain that way well into the 1970s locally. My hunch (entirely unscientific) is that it is responding to increased nutrient availability, as it seems to be a frequent associate of *Urtica dioica* (Common Nettle). It is particularly abundant on local chalk and gravel substrates, but seems to avoid heavy clays. When it does appear, it can rapidly dominate swathes of 'natural' vegetation, as Nick remarks. It would be interesting to hear from other people's experience of this in their parts of the country.

References:

DONY, J.G. (1967). *Flora of Hertfordshire*. Hitchin Museum, Hitchin.

JAMES, T.J. (2009). *Flora of Hertfordshire*. Hertfordshire Natural History Society, Welwyn Garden City.

Spartina patens in West Sussex, v.c.13

GEORGE HOUNSOME, *14 St John's Rise, Woking, Surrey, GU21 7PW*;
(george.hounsome@btinternet.com)

The least energetic way to get to Pilsey Island, at the southernmost tip of Thorney Island in Chichester Harbour, West Sussex, is to get a pass from the MoD and drive most of the way there, but if you do that you miss a pleasant walk along the sea wall on the east side of Thorney and don't see any of the saltmarsh flora. In 2005, Tony Spiers was walking on the sea wall with some ornithological friends when, next to the sea wall at the top of the saltmarsh, he noticed a patch of grass that he recognised as a cord-grass resembling a small *Spartina pectinata* (Prairie Cord-grass), a wetland species of North America, but clearly something different. His Googling 'Spartina' produced an abundance of images, including one of *Spartina patens* (Saltmeadow Cord-grass), a grass native to the Atlantic coast of North America. This looked just like the grass he had found, so for confirmation he sent it to Eric Clement (see photo inside front cover), who passed it to Filip Verloove of Meise, Belgium, who agreed with Tony's determination. On 14th August 2012, the patch (at SU76910177) was about 3 × 8 metres and in full flower (see photo inside front cover). It looks as if it has been there for some time and is about the same size as when first found, any expansion being by rhizomatous spread rather than by seed. A search of the saltmarsh along the east coast of Thorney found no other colonies.

S. patens is a plant of the upper zones of saltmarshes in its native area, at this one site in the UK and in other parts of the world, where it has become a too-invasive pest, such as the west coast of North America and the Atlantic and Mediterranean coasts of the Iberian Peninsula. As so often with plants like this, the source of the Thorney colony is conjectural. Given the distance and currents, it is unlikely to have crossed the Atlantic unaided. SanLeón *et al*. (1999) suggest that it has been present in Galicia, northern Spain, since at least the early part of last century and perhaps even earlier, having been discarded after its use as cargo packing material, and this could be true for our colony. If so, are there undetected patches in saltmarshes nearer to the port of Southampton? Or it may have grown from fragments carried on the seaways north from the Iberian coast; although the site is well up the English Channel inside a zone of creeks and islands and one would expect other colonies nearer the open sea. It is more likely that it was brought by one of the many boats that use Chichester Harbour for recreational purposes, or perhaps by wildfowl. I suppose it could have been planted originally, but the only supplier listed in the *RHS plant finder* is in Diss, Norfolk, a long way away.

Many competent botanists have walked the sea wall in the past decades, so how did *S. patens* escape detection? SanLeón *et al.* (1999) state that it had rarely flowered in Galicia by that time and this may have been the case at Thorney. Vegetatively, it is unremarkable at a casual glance, perhaps being taken for *Juncus gerardii* (Saltmarsh Rush) by a man with Pilsey Island in his sights. Be that as it may, inquiring, sharp-eyed Tony Spiers noticed it all right in 2005, and it flowered well in 2011 and 2012. This is the first British record for the species. Unfortunately, it was found too late to be mentioned in Ryves *et al*. (1996), but it is included and keys out cleanly in the invaluable *Vegetative key* by Poland and Clement, the first British flora to list it. Once known, it would be hard to mistake for anything else.

I would like to thank Tony Spiers for his agreeing to my writing up his discovery, Eric Clement for taking me to see it in the first place and both for helpful comments on this note.

References:

POLAND, J. & CLEMENT, E.J. (2009). *The vegetative key to the British flora*. John Poland, Southampton.

Royal Horticuultural Society (2011). *RHS plant finder 2011-2012*. Dorling Kindersley, London.

RYVES, T.B., CLEMENT, E.J. & FOSTER, M.C. (1996). *Alien grasses of the British Isles*. Botanical Society of the British Isles, London.

SANLEÓN, D.G., IZCO, J. & SÁNCHEZ, J.M. (1999). '*Spartina patens* as a weed in Galician saltmarshes (NW Iberian Peninsula)'. *Hydrobiologia*, **415**: 213–222.

NOTICES

2013 Annual Exhibition Meeting

Saturday, 23 November 2013
10.30 – 17.30

At
The Flett Lecture Theatre, Natural History Museum
Cromwell Road, London

For this year's Annual Exhibition Meeting we are returning to the Natural History Museum with what we hope will prove a lively, informative and inspirational programme of talks and exhibits. All BSBI Members and their guests are welcome to attend and we particularly invite new Members for whom the event will be an opportunity to gain an insight into the BSBI by meeting other members, and hearing about our activities and how they might contribute.

We have chosen a theme of 'Plants, Publicity and People' to reflect the Society's growing involvement in publicity and outreach aimed at communicating our achievements and engaging more closely with a broad range of stakeholders plus the public at large. Other talks will provide an update on activities in different regions of Britain and Ireland and highlights from the 2013 programme of field meetings.

As always, we encourage members to bring posters and exhibits on any aspect of botany including notable discoveries, newsworthy developments, local recording initiatives and, in keeping with the theme of the AEM, work to promote the causes of botanical recording and conservation. Please also continue to bring live or pressed specimens of plants requiring identification; this is a rare opportunity to pick the brains of some of the most accomplished botanists in the BSBI!

In addition, we hope to arrange guided tours of the Natural History Museum's botany collections, and our book-sellers will be present with a wide selection of specialist literature on botany and natural history, including rare and second-hand books, many with reduced prices for BSBI members.

The full programme of the meeting and forms for offering talks and exhibits will accompany the September edition of *BSBI News*. In the meantime, please think how you might contribute and feel free to send ideas and suggestions to the Meetings Committee care of Uta Hamzaoui (uta.hamzaoui@yahoo.de). We look forward to meeting everyone in November!

Any thoughts on AEMs?

LOUISE MARSH (Publicity Officer), *The Herbarium, Dept of Biology, Adrian Building, University of Leicester, University Road, Leicester LE1 7RH* (publicity@bsbi.org.uk)

Elsewhere in this issue of *BSBI News*, there is an announcement of the next Annual Exhibition Meeting (AEM) to be held at the Natural History Museum, London, on 23rd November this year. AEMs are a long-standing fixture in the BSBI calendar, bringing together some of the country's most active botanists, whether experts or beginners, and are a highlight of the year for some members. However, some attendees in recent years have expressed disappointment that AEMs don't attract as many exhibitors as they used to, although attendance figures have been very healthy and we are looking for larger venues in future. The BSBI Meetings Committee is keen to solicit your views on the optimal structure of an AEM, in order to tailor this event to the largest audience possible, both in 2013 and in years to come.

I spoke to several new members at the 2012 AEM in Cambridge, some of whom had been recruited during the previous summer's outreach activities, and asked them for their first impressions of a BSBI AEM. Common responses ranged from 'If I'd known, I'd have joined BSBI years ago' to 'does this society really want beginners like me in it?' to 'can anyone exhibit?' Yes, they can, and non-members are also very welcome to attend.

Based on feedback forms handed out at the 2012 AEM, the herbarium tours and the talks were rated 'most popular activities'. We are assembling a programme of invited talks for this year, and hope that there will be a chance to go behind the scenes at the NHM. But… could we encourage more people planning to attend the AEM to offer short talks, posters, or to bring material, whether for exhibition or to seek help with identification?

Lynne Farrell and I are hoping to put together an exhibit on AEM exhibits through the years, and the botanists who contributed. If you have been attending AEMs for longer than you care to remember, do you have any photographs, anecdotes or even an old poster lurking in the loft? If so, please consider contributing to our proposed "History of the AEM" exhibit, and contact me (publicity@bsbi.org.uk).

With so many botanists assembled in one room, couldn't we produce a resource to assist new members/beginners? One possibility would be collecting mnemonics from members, building on Chris Metherell's article in the last *BSBI News*, and collating the best of these into a crib-sheet for beginners, available on the Society's website. A life-time's experience can't be downloaded, but tips from the experts are always worth hearing. A resource like this would be an excellent reminder of the expertise available within the Society and the keenness of more advanced botanists to help those starting out in botany.

More generally, please also email me with ideas on any possible changes we might make that would increase the likelihood of you attending an AEM and your enjoyment of such an event. Or if you are perfectly happy with the *status quo*, let me know that also!

Volunteers needed for Threatened Plants Project 'mopping-up' in 2013

KEVIN WALKER, *Head of Research & Development, 97 Dragon Parade, Harrogate, North Yorkshire HG1 5DG*; (Tel.: 01423 538553; Mob.: 07807 526856; kevinwalker@bsbi.org.uk)

Last year was the final full year of the Threatened Plants Project (TPP), in which we aimed to survey populations of 50 of Britain and Ireland's most threatened species. Thank you to *everyone* who has contributed their valuable time and expertise to the project over the past five years. The data are being digitised and the forms scanned to create a digital archive. In

addition, data analysis and report writing has begun on species covered in 2008. However, there is now an opportunity to do some 'mopping-up' of TPP sites that were previously selected but remain un-surveyed.

We recently sent vice-county recorders a list of such sites for the first four years of the survey (2008-11 inclusive). A list of the sites selected for 2012 is still available on the BSBI website, along with all the TPP guidance and recording forms (www.bsbi.org.uk/tpp.html). We would be pleased to receive completed TPP forms for any of the un-surveyed sites, and particularly for species for which we only had partial coverage. These are listed in order of importance in the table below.

Species	Common Name	Number of selected sites surveyed (2008-2011)
Fallopia dumetorum	Copse-bindweed	12*
Silene conica	Sand Catchfly	12*
Sibbaldia procumbens	Least Cinquefoil	17*
Galium pumilum	Slender Bedstraw	18
Orchis ustulata	Burnt-tip Orchid	19
Cicendia filiformis	Yellow Centaury	20
Herminium monorchis	Musk Orchid	21
Hordeum marinum	Sea Barley	21
Melittis melissophyllum	Bastard Balm	26
Polystichum lonchitis	Holly-fern	26
Torilis arvensis	Spreading Hedge-parsley	26
Pseudorchis albida	Small-white Orchid	32*
Stellaria palustris	Marsh Stitchwort	32*
Oenanthe fistulosa	Tubular Water-dropwort	43*
Baldellia ranunculoides	Lesser Water-plantain	52*

*This represents less than 40% of all selected sites for this species.

It is really important that forms are completed, even where (or *especially* where) the target population was not found. For these, it would be very useful to receive a reason, or, where you are unsure, informed speculation on why the population was not found.

This is not *just* a project for vice-county recorders and we would be very pleased if members would like to help with this mopping-up exercise. If you would like to offer your services, please contact your local vice-county recorder direct (contact details on the BSBI website or the Yearbook). Or, if you can spare more time to help over a larger area (*e.g.* several vice-counties), please get in touch with our Scottish, English, Welsh or Irish contacts, who will co-ordinate volunteer effort and liaise with vice-county re corders. Send them a note of your availability and any particular geographical or other preferences.

The contacts are:

Eric Meek (erandammeek@gmail.com) in Scotland;

Bob Ellis (bob@elymus.demon.co.uk) in England;

Paul Green (welshofficer@bsbi.org.uk) in Wales

Maria Long (maria.long@bsbi.org.uk) in Ireland.

The Society for Economic Botany conference, Plymouth 2013

SUSANNE MASTERS, (Tel. (UK): 07950 187 354; info@susannemasters.com)

As a society with the mission of "fostering research and education on the past, present and future uses of plants by people," the SEB has many areas of shared interest with the BSBI, including: plant identification – especially of cryptic plants e.g. vegetative identification, invasive species, plant conservation, and collection of wild animals

The SEB. annual conference is attended by members from across the world working in a variety of roles that range from teaching in higher education to managing national botanical gardens. Last year the conference was held in Frostburg, Maryland, USA. Being situated in the Appalachians, the scientific programme had a strong focus on local plant issues, including the collection of local wild plants for trade (*e.g. Panax quinquefolius* or American Ginseng) and other causes of plant population decline.

Members come from different fields of academic study, including archaeobotany, anthropology, biology, geography and conservation science. This makes the meeting a great forum for hearing about a range of research and methods used that include laboratory analysis of molecular properties of plants, DNA work, Geographical Information Systems, population modelling and ethnography.

The conference in Plymouth is a rare opportunity to meet an international group of people who are passionate about plants. It is also an opportunity to highlight the flora of Britain and Ireland, and the unique records the BSBI produces and curates in the form of the *Plant Atlas*.

I attended the conference last year, made many new friends, met people to work with on academic collaborations and have an amazing network of contacts who continue to email me when they come across information they think might be useful to me (anything from funding opportunities to contacts in the same research and country area I am working in).

Full details of the conference programme can be found on the SEB website:

http://cms.gogrid.econbot.org/

Brief conference outline:

Thursday 27th June: Pre-conference behind scenes field trip at Kew Gardens for SEB members (standard Kew entry rates apply).

Friday 28th June: Optional field trips in Devon in the day, on which BSBI members with their knowledge of local flora would be most appreciated, conference opening and social in the evening.

Saturday 29th June: Symposium, workshops, student mixer in the evening.

Sunday 30th June: Conference presentations.

Monday 1st July: F ield trip to the Eden Project

Tuesday 2nd July: Conference presentations (day), banquet at Aquarium (included in registration).

Time of registration	Professional Member	Student Member	Non-member
Early*	£250	£125	£290
Late	£300	£165	£340

*Early rates for bookings made by 31st May.

Accommodation can be booked via the University, or there is a conference rate for Jury's Inn via conference registration.

I am on the panel organising the conference, and am the SEB student representative for Europe. If anyone has questions please do get in touch with me. Email is probably easiest, as I will be in Turkey on field research April-May.

A *Fenland flora* – an announcement

OWEN MOUNTFORD, *Centre for Ecology & Hydrology, Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxfordshire, OX10 8BB*; (om@ceh.ac.uk)
JONATHAN GRAHAM (jonathan.graham@ntlworld.com)

Why compile a *Fenland flora*?

Fenland is one of the most intensively farmed areas of Europe, stretching from Lincoln in the north to Cambridge in the south and occupying about 4000km^2. Reclaimed over centuries from tidal marshes and floodplain fens, the present landscape is one of large arable fields separated by ditches that feed into a highly engineered network of main drains and rivers. Most of this former wetland is at or around sea-level and depends upon complex flood defences to protect it from marine and riverine flooding. Older human settlements in Fenland are often sited on slightly higher land (normally 2-10m above sea level) that would have been islands within the ancient, undrained wetland, and it is on these clay islands standing above the peat and alluvial soils that the great majority of pre-19th century development is situated.

Within the modern Fens, the main refuges for native wetland plants and vegetation are drainage channels, older road verges and floodbanks, and locally flooded gravel and clay workings. On the 'islands' were natural woodlands (the last felled in World War II) and grassland created for livestock and the draught animals that worked surrounding arable land. Increased human population, mechanisation of agriculture and the demise of mixed farming has greatly diminished the extent of these old grasslands during the 20th and 21st centuries. Between the *First land utilisation survey of Britain* (Stamp, 1937) and the *Land cover map* of 2007, the proportion of arable land rose from 68% of Fenland to 83.7%, whilst the grassland area fell from 22.4% to only 8.6%.

The counties that make up Fenland have been studied botanically since at least the 17th century, but, almost without exception, the Fenland parts of these counties have been relatively neglected. Few botanists have been resident in Fenland, and those from outside have often perceived the region as of little interest. Some areas were under-recorded, *e.g.* the Cambridgeshire part of TL29 was believed to have <350 species but has been shown since *c.*1970 to have at least twice that number. Other areas, especially out in the 'cabbage patch' of south-east Lincolnshire, had hardly any detailed data. The Fenland needs a proper account of its flora – but what kind of flora

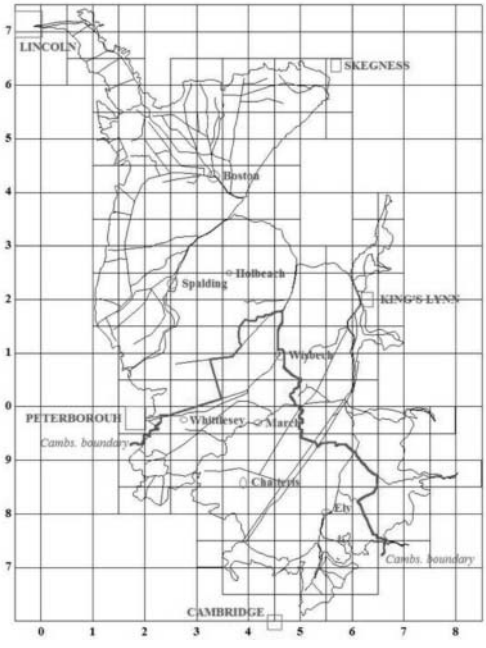


Fig. 1. Boundary of the Fens as used in the *Fenland flora* (showing main settlements, watercourses and the Cambridgeshire border, to aid location).

The *Fenland flora* project: defining the Fens

The Fenland Basin is the subject of a major long-term survey (*c.*2006-2016) to map the distribution of the entire vascular flora and to characterise the plant assemblages that occur in this mainly artificial landscape. The project differs from the UK tradition of floras for administrative counties in that the focus is a landscape defined by topography, hydrology

and soils – see boundary map. Of floras in lowland England, only John Trist's *Ecological flora of Breckland* (1979) is really comparable to this innovative project. The guiding principles for defining Fenland are:

- Altitude <5m AOD, except on wholly included Fenland islands.
- On loamy peats and groundwater gleys, but including brown soils and stagnogleys on islands and in the Townlands, as well as unripened gleys of the Wash saltmarshes.

The recording unit for the survey is the 4km^2 tetrad of the UK national grid. The approach combines new field surveys of all important habitats present within each tetrad and a compilation of records from published and database sources for the period since 2000, as well as an account of floristic change over the centuries and up to the present day. The project is also contributing information directly to all the projects from vice-counties that overlap Fenland and which are co-ordinated by BSBI recorders.

Progress to winter 2012-2013

The *Fenland flora* project is assembling a database of species growing in this region. The focus for new surveys has been mainly on areas previously under-recorded, but important datasets from sites of conservation importance (*e.g.* Wicken Fen and the Ouse Washes) have also been incorporated. Despite the incomplete coverage, clear patterns are already emerging, especially for aquatic macrophytes and the species of older grassland. These surveys confirm the importance of some well-known sites (*e.g*. those highlighted in the *Fens Biodiversity Audit*) as well as indicating new areas meriting attention and populations of regionally scarce plants.

Next steps – how you can help

In the first phase of the project we have made considerable progress in surveying the Fenland, but we now want to redouble our efforts and involve more people with an interest in this unique area. The *Fenland flora* will continue to target tetrads without any modern data or with very sparse information, attempting to complete coverage of the region in the next 4-5 years. Attention will also be paid to the river valleys entering Fenland where they meet the definition of the flora area, as well as any potential hotspots for botanical diversity.

Anyone interested in contributing to the *Fenland flora* should contact the authors.

Recorders Conference, 6th – 8th September 2013

The Recorders Conference is not just for county recorders – it is also attended by most of the officers and staff, as well as many active members of the society. It starts on Friday at lunch time and finishes after lunch on Sunday. It includes talks by leading taxonomists, plant identification sessions, workshops, and a field meeting. There will be opportunities to get to grips with the Big Database or refine your skills using MapMate.

The conference takes place at Manchester Metropolitan University's premises in Shrewsbury, with accommodation a short walk away at the brand new Premier Inn hotel. The full cost for the weekend is £240 per person, including all meals (reduced price of £220 for volunteers) or £320 for two people sharing a twin or double room. Alternatively, the non-residential price is £60 if you arrange your own accommodation and evening meals (there is plenty of choice within walking distance in Shrewsbury).

To book a place, either look online at www.bsbi.org.uk or send a cheque for the appropriate sum (made out to BSBI) to Alex Lockton, 6 Teynham Road, Whitstable, Kent, CT5 2EF. Cancellations may not be accepted after the end of July. For more details and a full programme when it is ready, visit the web site.

REQUESTS

Volunteer wanted to work on threatened plant specimens at the Natural History Museum

For some years the BSBI was lucky enough to have a volunteer, Alison Lean, who came in and worked in the Herbarium on a range of rare and threatened species. This produced some really excellent historical records that are of use to us in more accurately determining change, since an awful lot of those herbarium specimens had not found their way either to our Recorders or to our central databases.

We are looking for another volunteer to carry on with this work,. The museum will provide database and herbarium curation training. and we would be happy, of course, to cover reasonable travel expenses.

Please contact either Mark Spencer at the NHM (m.spencer@nhm.ac.uk; Tel.: 0207 9425787) or David Pearman (dpearman4@aol.com; Tel.: 01872 863388) if you are interested.

Glasshouse weed recording: can you help?

SAM THOMAS, *Conservation and Research Department, National Botanic Garden of Wales, Llanarthne, Carmarthenshire, SA32 8HG*; (Tel.: 07874 306090; sjt9@aber.ac.uk)

While there has been an increase in the recording of alien species, relatively little attention has been paid to the weed flora inside glasshouses and polytunnels. Some adventive species arriving via the horticultural and agricultural trades may well complete a 'lag-phase' of adaptation in the greenhouse environment before invading external ecosystems. An interesting example of this could be the plant-pot and rockery weed *Cardamine corymbosa* (New Zealand Bittercress).

I am currently conducting research on glasshouse weeds in conjunction with Aberystwyth University and the National Botanic Garden of Wales. My project aims to shed some light on the distribution, diversity and movement of weeds in the protected environment. The major part of my research will involve surveying a wide range of glasshouses and related structures. Time limits mean that I have had to restrict my own survey effort to Wales and a handful of major botanic gardens across the rest of the UK and Ireland.

My research would be much improved with data from a wider geographical spread. To that end, I am hoping to involve as many people in the recording effort as possible. Over the coming recording season any and all records from glasshouses, polytunnels and the like would be gratefully received, although, owing to my project write-up deadline, records would have to be received by the end of August for them to be included in the findings.

I have created a standard form for glasshouse weed recording. I am happy to provide hard copies in the post (with an SAE for return), whether you are interested in targeting some of your local glasshouses or just want some forms to carry around in case of a chance encounter with a glasshouse while out recording. The form is also available to download at this web address (copy into your browser): bit.ly/X9kYJg.

I realise that recorders are busy with many different recording efforts so any help, however small, would be very much appreciated. I plan to present my progress at the BSBI AGM and will send all of my records to the relevant recorders this autumn.

Thanks in advance for any assistance.

Pulsatilla leaf smut: only one British site?

DR A. MARTYN AINSWORTH, *Mycology Section, Jodrell Laboratory, Herbarium, Library, Art & Archives, Royal Botanic Gardens, Kew, Surrey, TW9 3AB*;
(Tel.: 02083 325366; m.ainsworth@kew.org)

Following on from my appeal (Ainsworth, 2012) to BSBI members for any sightings of *Puccinia bupleuri*, a rare rust fungus found only on *Bupleurum tenuissimum* (Slender Hare's-ear), I am now hoping to focus botanical attention on a smut fungus which has but a single, and very recent, vouchered British record as far as I am aware.

Urocystis pulsatillae, formerly recognised as a form of *U. anemones* or simply filed under that species name, is a leaf smut restricted to our native *Pulsatilla vulgaris* (Pasqueflower) and other species of *Pulsatilla* occurring in Europe, Asia, North America and Australia (Vánky, 1994). The name *U. anemones* was formerly more widely applied to smuts infecting various species of Ranunculaceae in several genera but is now reserved for those occurring on *Anemone* including *A. nemorosa* (Wood Anemone). A search in the national collections of British smut specimens at Kew failed to reveal any filed under *U. pulsatillae* or collected from leaves of *Pulsatilla vulgaris* (*A. pulsatilla*) and filed under *U. anemones*. A similar blank was drawn after consulting the *Checklist of the British & Irish Basidiomycota* (Legon & Henrici, 2005) and its online updates. Nevertheless, an earlier compilation of smut records (Mordue & Ainsworth, 1984) noted that *U. anemones* had indeed been historically recorded on Pasqueflower (as *A. pulsatilla*) in Britain. Checking the references therein for details of sites, collectors and dates yielded but a single record (*fide* Moore, 1959). This was dated 1931, from Sussex, and so falls outside the native range of the host according to the *New Atlas* (Preston *et. al*., 2002). This suggests that the smut was seen in Sussex on a cultivated or otherwise introduced plant and, since voucher material has not been traced, there was a palpable need for some recently-collected material to support its inclusion on the British list.

The necessary voucher was found, quite by chance, on 1st August 2012 by Alison Woods. She was accompanying Andy McVeigh on a survey for the Sect. 41 rust fungus of conservation concern *Puccinia thesii* (Bastard Toadflax Rust – another one to look out for) and the find was described thus: "as is often the way the 'by-catch' produced the most exciting find of the season" (McVeigh, 2013). The smut was seen during a close inspection of short chalk turf on Therfield Heath, Hertfordshire, on three plants occurring within a metre or so of each other. An infected leaf (see Colour Section, Plate 4) was sent to the author, microscopically checked for smut spores, duly deposited in Herb. K as K (M) 178427 and annotated as the first British record.

U. pulsatillae causes blisters on leaves and stems which rupture to form sporulating pustules (sori) from which the powdery masses of blackish spore balls (aggregations of 1–5 spores) are dispersed (Vánky, 1994).

News of any further extant British populations of this apparently rare fungus would be most welcome, preferably accompanied by a voucher specimen. Please contact me at the address above.

References:

AINSWORTH, A.M. (2012). 'Wanted: Rusty Slender Hare's-ear'. *BSBI News*, **121**: 62.

LEGON, N.W. & HENRICI, A. (2005). *Checklist of the British & Irish Basidiomycota.* Royal Botanic Gardens, Kew.

MCVEIGH, A. (2013). *Survey/sampling of Section 41 fungi at selected sites in Oxon/Bucks/Berks/Cambs.* Unpublished Species Recovery Report for Natural England.

MOORE, W.C. (1959). *British parasitic fungi.* Cambridge University Press, Cambridge.

MORDUE, J.E.M. & AINSWORTH, G.C. (1984). *Ustilaginales of the British Isles* (Mycological Paper 154). Commonwealth Mycological Institute, Kew.

PRESTON, C.D., PEARMAN, D.A. & DINES, T.D. (eds.) (2002). *New atlas of the British & Irish flora.* Oxford University Press, Oxford.

VÁNKY, K. (1994). *European smut fungi.* Gustav Fischer Verlag, Stuttgart.

Juncus ranarius – inland plants

MICHAEL WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

Juncus ranarius (ex *J. ambiguus*) Frog Rush, is a scattered plant of damp brackish coastal sands around the UK and is rarely found inland. According to the BSBI maps (bsbi.org.uk) there are a reasonable number of vice counties where it has been found inland, though one or two of these are likely to be mapping errors and some are quite old. It can be a difficult taxon to identify from forms of *Juncus bufonius* (Toad Rush) as there are not too many characters to go on.

It is possible that Frog Rush is overlooked perhaps as a halophyte on treated road verges and elsewhere where conditions allow. There are often small rosette-like plants on road verges which could potentially be this taxon and some investigation will be made this year. However, I would be grateful for any material of suspected Frog Rush (but also including a bit of coastal material if possible) or even if it is thought to be Toad Rush so that other characters can be looked at to see if this might help with the identification and to see if any inland plants could be it (it would be useful if anyone could check on it at known inland sites with a voucher if possible). The plants should have mature capsules as these can be useful – in a plastic bag please. Thank you, postage paid.

Aphanes arvensis and *Aphanes australis*

MICHAEL WILCOX (*details as above*)

As the (latest) referee for *Aphanes arvensis* (Parsley-piert) and *A. australis* (Slender Parsley-piert), I would like to encourage recording of these two taxa. These Parsley-pierts are widespread and relatively frequent in some areas. There appears to be more records where Floras have been or are being done, so there is some bias in frequency. Floras such as the *Flora of Cardiganshire* (Chater, 2010) clearly show that *A. australis* is much more common than *A. arvensis*, the latter being uncommon in v.c.46. This could be the situation in a number of areas, though there could equally be areas where both are as scattered to frequent as each other. Also, the BSBI online maps show that some old records have been recorded as an aggregate, as it was considered one species in the past, and still today they may occasionally be recorded as *A. arvensis s. l.*

I would be interested in any material, including herbarium material and vouchers, even if identified in the field etc. It need not be a fruiting plant, so there would be no need to return to any sites. Only one to two strands of a plant are needed (with relevant details) and material could be saved up during the year and sent later. Follow Stace (2010) for characters, as other works relating to the shape of leaves and internode type are of little or no value for identification and are misleading. Fruiting hypanthia can vary in size, especially in *A. arvensis*, but the largest (usually those closest to the stem on the longest pedicels) should be measured, and stipule characters are one of the more important aspects of identification, especially for 'vegetative' identification. These plants should not be identified on jizz alone. There are some technical microscopic characters (unpublished) that can confirm these two species without fruiting hypanthia if necessary. I would welcome material from elsewhere in the world and especially other species where identified by an expert/resident botanist for the relevant country.

References:

CHATER, A.O. (2010). *Flora of Cardiganshire*. Privately published, Aberystwyth.

STACE, C.A. (2010). *New flora of the British Isles*. 3rd ed. Cambridge University Press, Cambridge.

Request for information about the smell of the Stinking Hellebore (*Helleborus foetidus*)

PROF. MICHAEL RICHARDSON, *Institute of Biology, University of Leiden, Sylvius Laboratory, Sylviusweg 72, 2333BE Leiden, Netherlands*; (m.k.richardson@biology.leidenuniv.nl)

I am conducting research into medicinal and poisonous plants and would like to ask BSBI members for their experiences with *Helleborus foetidus* (Stinking Hellebore). My question to you is: "Does Stinking Hellebore actually smell of anything?" Many books state that the plant has a strong, offensive odour, while others state that it has little or none. The plants I have examined in the Dutch garden trade have no odour whatsoever in any part — fresh, bruised or dried. Is it possible that there are different genetic strains, or that the odour varies according to season or location? I would be grateful if you could write to, or email me, with your experiences, or with any literature you know of that addresses the issue.

With many thanks.

OFFERS

Wiltshire Botany, 14

Issue 14 of this journal is now published. It includes a guide to the nature trail at Marlborough College; significant new finds in the fungi of Great Wood, north of Swindon; description of new finds of abnormalities in plants since the society's *Abnormalities in plants*, published in 2009; accounts of the most exciting finds in vascular plants and bryophytes in 2011; the usual summary of society records in that year, featuring species found in new 10 km squares; and summaries of Wiltshire-relevant articles published elsewhere – on unusual trees, dry stone wall flora conservation, protected road verges and canal management.

Contributions to the journal are welcome on any aspect of Wiltshire botany. Articles should be submitted to John Presland, 175c Ashley Lane, Winsley, Bradford-on-Avon, BA15 2HR, who will also be pleased to discuss proposed articles informally (Tel.: 01225 865125). A leaflet is also available, offering guidance to authors on the most helpful forms in which to submit articles.

Copies of No. 14 and some earlier issues are available from Alison Robinson, 3 Yew Tree Lane, Broad Hinton, Swindon, SN4 9RH (Tel 01793 731947; robinsop@btinternet.com). The cost is £5.00, post free. Cheques should be made out to Wiltshire Botanical Society. However, all articles in all issues are available free online via: www.wiltsbotsoc.co.uk.

Three Teesdale papers on offer

DR MARGARET E BRADSHAW, *Hill Top, Eggleston, Barnard Castle DL12 0AU*

1. An illustrated leaflet of 20 members of the Teesdale Assemblage of Rare Flowering Plants is available from Dr Margaret E Bradshaw, Hill Top, Eggleston, Barnard Castle DL12 0AU. Please send a SAE 9 x 5ins or A5 and include an unused 2nd class stamp towards cost of production.
2. A paper – *Four Centuries of Plant Hunting in Upper Teesdale* by Dr. Margaret E Bradshaw in the Teesdale Record Society Journal (3rd Series) **20**: 33-50; this is a development of the paper given at the BSBI Conference at Birmingham. Available from Dr W. F. Hayes, High Dyke House, Middleton-in-Teesdale, Barnard Castle DL12 0RR cost £6.50 incl. p&p

3. A paper by Dr Frank Horsman – *The Earliest Botanists in Teesdale* in the Teesdale Record Society Journal (3rd Series) **19**: 25-35 available from the same address cost £6.50 incl p&p

Both copies (2. & 3.) ordered together £10.00. Earlier copies are available; please go to the Society web site for availability and prices:
www.teesdalerecordsociety.org.uk

NEWS OF MEMBERS

Hypericum monograph completed

ROY VICKERY, *9 Terrapin Court, Terrapin Road, London, SW17 8QW*

Congratulations to our Honorary Member, and former editor of *Watsonia*, Norman Robson, who, in November 2012, published the final part of his monograph of *Hypericum*. This work, which grew from Norman's PhD studies, covers over 400 species, and consists of nine parts, the first of which was published in 1977. Norman is now working on *Vismia*, a tropical genus of Hypericaceae.

Charles Turner awarded the Albrecht Penck Medal 2012

The following was drawn to our attention from the Cambridge University Quaternary Palaeoenvironments Group website:
http://www.qpg.geog.cam.ac.uk/people/turner/

> Long-standing Cambridgeshire botanist and BSBI member, Charles Turner, was awarded the prestigious Albrecht Penck Medal by the Deutsche Quartärvereinigung (DEUQUA) at their 36th Hauptversammlung in Bayreuth in September 2012, to mark his contribution to Quaternary research.

Charles is Visiting Professor in the Quaternary Palaeoenvironments Group, with a special interest in late Glacial and early Holocene vegetational history. Our congratulations go to Charles.

REPORT OF FIELD MEETING 2012

The following field meeting report was inadvertently omitted from *BSBI Yearbook 2013*, and is given here to avoid its being unduly out-of-date by the publication of next year's *Yearbook*.

Kirkcudbrightshire (v.c.73) Scottish Recording Week 30th June – 6th July 2012

DAVID HAWKER

A group of 12 botanists, one non-botanist, and Hilary our cook, from as far afield as London, Bristol, Lincolnshire, Ayr and Perth , gathered at Orroland Lodge, a luxurious Victorian hunting lodge set in its own wooded grounds, overlooking the Solway Firth and the Lake District. After an excellent evening meal, the programme for the week was set out. The party would split into three groups each day before heading out. The vice-county is neatly divided geographically into two halves and the programme covered only that half to the east, between the Water of Ken – River Dee and the boundary with v.c.72 Dumfries.

The first day was taken up with a survey of the nearby 1900 ha MOD Training Range, which has a wide variety of species scarce in the county. The objective was to record the presence of all species occurring over parts of the Range, which had not previously been studied in detail, so as to identify the site's conservation interest for the Integrated Land-

management Plan. Before starting we had to undergo a Health and Safety briefing by the Camp Commandant. Whether he was pleased with a 9 a.m. start on a non-working Sunday was not obvious. The groups recorded some of the specialities of the area – *Glaucium flavum* (Yellow Horned-poppy), *Echium vulgare* (Viper's Bugloss) at one of only two extant county sites, *Eryngium maritimum* (Sea Holly), *Allium carinatum* (Keeled Garlic), *A. paradoxum* (Few-flowered Garlic), *Apium graveolens* (Wild Celery), *Asplenium ceterarch* (Rusty-back Fern), *Cirsium heterophyllum* (Melancholy Thistle), and *Vulpia bromoides* (Squirreltail Fescue), the last four new to this site; and good populations of both *Spergula arvensis* (Corn Spurrey) and *Scleranthus annuus* (Annual Knawel). One member was to arrive later that day and couldn't join us on the Range, but instead surveyed the coastline below Orroland Lodge, producing a new record for the Nationally Scarce *Carex punctata* (Dotted Sedge). That evening, the large living room and the adjoining dining room provided ample space for id. work, both before and after dinner, as they did for the rest of the week (see Colour Section, Plate 3). In all, that day provided 358 species, with 47 new to the MOD area.

The following day also had a military aspect, as one group surveyed the old and now defunct Munitions Factory at Dalbeattie, apparently the first time this area has been surveyed systematically. In all, 236 species were recorded, the highlights being a large population of *Limosella aquatica* (Mudwort), *Senecio erucifolius* (Hoary Ragwort) new to the vice-county, several plants of a *Juncus* suspected of being either *J. dudleyi* (Dudley's Rush) or *J. compressus* (Round-fruited Rush) (sent to referee), and, unexpectedly for such a lowland site here, *Empetrum nigrum* (Crowberry), *Rhynchospsora alba* (White Beak-sedge), and both *Eriophorum* spp. (Cottongrass). Other groups went to the coastal sites of the Almorness Pensinsula and Powillimount, where there are some calcareous outcrops in what is an otherwise geologically acid county. The Almorness group discovered *Centunculus minimus* (Chaffweed), a species rarely seen in the county, *Cakile maritima* (Sea Rocket), *Blysmus rufus* (Saltmarsh Flat-sedge), both *Zostera* (Eelgrass) spp., *Allium scorodoprasum* (Sand Leek), *Hypericum elodes* (Marsh St John's Wort), *Anagallis tenella* (Bog Pimpernel) and a very wide range of sedges reflecting the varied habitats of the site – *Carex arenaria* (Sand Sedge), *C. distans* (Distant Sedge), *C. disticha* (Brown Sedge), *C. otrubae* (False Fox-sedge), *C. vesicaria* (Bladder Sedge) and *C. pallescens* (Pale Sedge) amongst the 15 species seen. The Powillimount group covered only a short coastal section of the tetrad due to the range of unusual species along the 50 metre wide coastal strip, such as *Juncus subnodulosus* (Blunt-flowered Rush), both *Blysmus* spp., *Limonium vulgare* (Common Sea-lavender) and *L. humile* (Lax-flowered Sea-lavender), *Centarium littorale* (Seaside Centaury), apparently still spreading along the county coastline, *Schoenus nigricans* (Black Bog-rush); and then, inland, with *Conium maculatum* (Hemlock), *Urtica urens* (Small Nettle) and *Galium cruciata* (Crosswort). This was, however, cut short by persistent rain and prompted a visit to the John Paul Jones (founder of the U.S. Navy) Museum for coffee and tea.

Day three was unpleasantly wet, but we concentrated on three tetrads in the northern part of the county where there were old records of *Gentianella campestris* (Field Gentian), *Platanthera* spp. (Butterfly Orchids) and *Coeloglossum viride* (Frog Orchid). Unfortunately none of the three parties re-found any of these, but one group had a remarkable day, recording *Melica nutans* (Mountain Melick), three previously unrecorded populations of *Meum athamanticum* (Spignel), *Eleocharis quinqueflora* (Few-flowered Spike-rush), *Gymnadenia borealis* (Heath Fragrant-orchid), *Polygonum boreale* (Northern Knotgrass), *Sorbus aria* (Common Whitebeam) and the hybrid *Sorbus* ×*thuringiana*, admittedly planted but the first county record of the latter. The highlights for the other groups were commoner species such as *Carex dioica* (Dioecious Sedge), *Linum catharticum* (Fairy Flax), *Parnassia palustris* (Grass-of-Par-

nassus), *Cardamine amara* (Large Bittercress), *Antennaria dioica* (Mountain Everlasting) and *Crepis paludosa* (Marsh Hawk's-beard).

The sand dunes, saltmarsh and foreshore of the 7km long Southerness – Mersehead beach was the site for the following day, with all groups walking the whole length of the strip. The day was cool but gloriously sunny and dry which brought out massed hordes of mosquitoes in the dune slacks and saltmarsh for those crossing it early in the day. The objective here was to record populations of scarcer county species, following a survey by DH of a short section last year, which showed unexpected populations of species found nowhere else in the county. Overall the group saw and recorded fine stands of *Artemisia stelleriana* (Hoary Mugwort) (see Colour Section, Plate 3), *Euphorbia paralias* (Sea Spurge), *Eryngium maritimum* (Sea-holly), *Trifolium arvense* (Hare's-foot Clover), *Phleum arenarium* (Sand Cat's-tail), *Calystegia soldanella* (Sea Bindweed) at its only county site, *Coincya monensis* (Isle-of-Man Cabbage), again the only county site, admittedly several kilometres long – with the Isle of Man visible in the distance, *Catabrosa aquatica* (Water Whorl-grass), *Parapholis strigosa* (Hard-grass), *Ononis spinosa* (Spiny Restharrow) (after much collective debate), *Polygonum oxyspermum* (Ray's Knotgrass), and *Viola tricolor* ssp. *curtisii* (Wild Pansy). Others included *Eleocharis uniglumis* (Slender Spike-rush), *Conium maculatum*, *Atriplex littoralis* (Grass-leaved Orache), *Papaver dubium* (Long-headed Poppy) and *Foeniculum vulgare* (Fennel). Unfortunately a band of *Bolboschoenus maritimus* (Sea Club-rush) and *Spartina anglica* (Common Cord-grass) is developing offshore and sheltering the mobile foredunes, so that the sand and vegetation is stabilising, and some of the species listed above are declining due to competition from more aggressive species, such as *Ammophila arenaria* (Marram), *Leymus arenarius* (Lyme-grass) and *Arrhenatherum elatius* (False Oat-grass) – a process and site to keep an eye on!

The next day saw us going widely separate ways along the north boundary of the county, some to the higher hills at around 500-600m, and one to 150-200m where Henry Moore statues stand in open ground at Glenkiln. One party attempted to re-find the only recent record of *Sedum villosum* (Hairy Stonecrop), unsuccessfully as the once wet heath with flushes had been converted to acid grassland in the intervening years. However, we saw *Saxifraga stellaris* (Starry Saxifrage) in several flushes and burn edges, *Festuca vivipara* (Viviparous Fescue), *Ranunculus omiophyllus* (Round-leaved Crowfoot) and *Euphrasia scottica* (Scottish Eyebright), among the 58 species recorded in part of that tetrad. The second party were luckier and found *Huperzia selago* (Fir Clubmoss), *Parnassia palustris*, *Oreopteris limbosperma* (Lemon-scented Fern), *Selaginella selaginoides* (Lesser Clubmoss), *Crepis capillaris* (Smooth Hawk's-beard) and *C. paludosa* in what was a more varied set of habitats. The Glenkiln party recorded 205 species in one tetrad, including *Galium mollugo* (Hedge Bedstraw), *Gymnocarpium dryopteris* (Oak Fern) on a steep burnside, *Circaea lutetiana* (Enchanter's-nightshade) and the hybrid *C.* ×*intermedia* (Upland Enchanter's-nightshade), *Verbena officinalis* (Vervain), the beautiful tracery foliage of *Equisetum sylvaticum* (Wood Horse-tail), the fragrant *Myrrhis odorata* (Sweet Cicely) and a number of garden escapes and aliens. An adjoining tetrad produced *Equisetum* ×*littorale*, *Vaccinium oxycoccus* (Cranberry) and *Valeriana officinalis* (Common Valerian) in an otherwise unexciting area. This group managed surprisingly to cover another adjoining tetrad, adding *Briza media* (Quaking Grass) in a small sedge mire, along with *Carex pulicaris* (Flea Sedge) and *C. hostiana* (Tawny Sedge), *Epilobium ciliatum* (American Willowherb), *Hydrocotyle vulgaris* (Marsh Pennywort) and *Utricularia minor* (Lesser Bladderwort). On the way home one group stopped to admire and photograph the only colony of *Ophrys apifera* (Bee Orchid) in the v.c., in all 32 flowering shoots this year, following none last year and 96 the year before, when it was first discovered; this with good stands of *Neotinea ovata* (Common Twayblade), *Dactylorhiza purpurella*

(Northern Marsh-orchid) and *Tragopogon pratensis* (Goatsbeard).

The last day was spent assessing grassland and farmland tetrads near Orroland, where there were old records for *Platanthera* spp., *Gentianella campestris* (Field Gentian) and *Carex limosa* (Mud Sedge). Again three parties tackled various tetrads, but such was the range of species present that only parts of each could be covered in the time available. None of the old records were re-found – agricultural intensification may be to blame, but the grasslands and wetlands provided considerable variety. Another two previously unrecorded *Meum athamanticum* (Spignel) populations, totalling 70 plants, were found, while other species included *Carex diandra* (Lesser Tussock-sedge), *Euphrasia arctica* (Arctic Eyebright), *Genista tinctoria* (Dyer's Greenweed), *Lemna trisulca* (Ivy-leaved Duckweed) (which seems to be spreading through the southern half of the county), *Ranunculus lingua* (Greater Spearwort), *Cicuta virosa* (Cowbane), and in one particularly attractive wooded glen *Gymnadenia dryopteris*, *Oreopteris limbosperma*, *Phegopteris connectilis* (Beech Fern), *Polystichum aculeatum* (Hard Shield-fern) and *P. setiferum* (Soft Shield-fern), *Viburnum opulus* (Guelder-rose) and the roses *Rosa mollis* (Soft Downy-rose), *R. sherardii* (Sherard's Downy-rose) and *Rosa rugosa* (Japanese Rose).

As a reward for the hard work of the morning, the groups re-assembled in the early afternoon at Carlingwark Loch SSSI to search for the site's specialities – *Ranunculus lingua*, *Stellaria palustris* (Marsh Stitchwort), *Cicuta virosa* – all successfully found and admired. Later in the afternoon we regrouped at Orroland and walked along the shore to see the local speciality, *Hierochloe odorata* (Holy-grass), and five small patches were found in the upper saltmarsh amid flushed stands of *Phragmites communis* (Common Reed) where these abutted the shore. Although not flowering, the shiny bright green leaves immediately attracted attention. Numerous other coastal species were found, including a previously unknown site for *Carex punctata* (Dotted Sedge) and abundant *Carex extensa* (Long-bracted Sedge).

One of the group surveyed nearby settlements each day in the early morning, returning in time for breakfast, and added just under 2000 records, of which there were 117 species not previously recorded for the vice-county, mostly garden escapes, casuals and aliens. In all, approximately 7000 records have been added to the database. My thanks are due to everyone for their efforts and help with covering areas that I would have been hard pushed to survey in time for the end of this date class, and for the excellent company and expertise. Our thanks are again due to Hilary for the appetising food and drink throughout the week.

Diary for 2013

LYNNE FARRELL, Hon. Gen. Sec., *41 High Street, Hemingford Grey, Cambs., PE28 9BJ*; (lynneonmull@btinternet.com)

8 May Board of Trustees, Society of Antiquaries, London
13 May Scottish Committee
11-14 June Coast & fens of Anglesey, Beaumaris, Anglesey
12 June AGM, Beaumaris
14 June Welsh AGM & Welsh Committee, Beaumaris
24 July Board of Trustees, London
14-15 Sep Irish AGM, Killarney
4 Sep Meetings Committee, Natural History Museum, London
6-8 Sep Recorders' Conference, Shrewsbury
24 Sep Scottish Committee
2 Oct Records Committee
16 Oct Publications Committee
16 Oct Training & Education Committee, Shrewsbury
23 Oct Council, Linnean Society, London
2 Nov Scottish AGM & Annual Meeting, Edinburgh
23 Nov Annual Exhibition Meeting, Natural History Museum, London

OBITUARY NOTES

CHRIS LIFFEN, *3 Grangecliff Gardens, LONDON, SE25 6SY*; (c.liffen@btinternet.com))

Since the publication of *BSBI News* **122**, we regret to report that the news of the deaths of the following members has reached us. We send regrets and sympathies to all the families.

Mrs H G Harvey, Y Fedwen Arian, Pantymwyn Road, Cilcain, Mold, Flints, CH7 5NL. She joined the BSBI in 1981.

Dr R M Jackson, 18 Braemar Close, Godalming, Surrey, GU7 1SA. He joined the BSBI in 2001.

Prof P G Jarvis, Duireaskin, Aberfeldy, Perthshire, PH15 2ED. He joined the BSBI in 1958.

Mr A Marshall, Ellenrod Farm, Newhey, Rochdale, OL16 4NU. He joined the BSBI in 1975.

Dr R J Pankhurst, 7 Eildon Street, Edinburgh, EH3 5JU. He joined the BSBI in 1967.

Mr E G Philp, 6 Vicarage Close, Aylesford, Kent, ME20 7BB. He joined the BSBI in 1971.

Mr R D Wise, South Mongers Farm, Mongers Lane, Barcombe, Lewes, East Sussex, BN8 5BQ. He joined the BSBI in 1952.

Obituaries of many will appear in *BSBI Yearbook 2014*.

Charles David (1948 – 2012)

ANNE HADEN, *Les Deux Ruelles, Le Feuguerel, St Lawrence, Jersey, JE3 1FT*; (annehaden@yahoo.co.uk)

Charles David, BSBI Recorder for Guernsey (v.c.113), died suddenly in September 2012 while on a trip to Sark. He was helpful and generous, always going out of his way to offer his valuable advice to anyone who asked, in this case to the people of Sark, to set up a Biodiversity Action Plan. Tragically his early death at the age of 64 left many such projects unfinished.

The Channel Islands' leading entomologist and marine biologist, Charles came to botany late in life after he helped set up the Guernsey Biological Record Centre. He rapidly learned about Guernsey's rich flora and he led tours around Guernsey's famous orchid fields. Running the Guernsey Biological Record Centre meant that Charles was ideally placed to take on the post of BSBI Recorder for the island, when Bridget Ozanne died. He was also skilled in IT and wrote a recording system for all the Channel Islands that used a palm-top computer linked to GPS to record plants, which could then be down-loaded onto a map to pin-point within a few metres where a plant had been seen. These records and many photographs of Guernsey's fauna and flora can be accessed on the Record Centre website (www.biologicalrecordscentre.gov.gg), which will be a lasting tribute to a distinguished naturalist. Most of all, Charles will be remembered for his infectious enthusiasm for safeguarding and preserving Guernsey's natural history. As the island's foremost ecologist, he undertook a habitat survey of the island, as well as producing numerous scientific papers. These will hopefully be used to develop and restore Guernsey's landscape, so ensuring the safe and continued well-being of the island's natural 'treasures'.

A modest and gentle man, Charles will be remembered for his passion for sharing the richness of Guernsey's flora and fauna with his many friends and colleagues. He will be greatly missed.

A fuller obituary will be published in *BSBI Yearbook 2014*.

RECORDERS AND RECORDING

Panel of Referees and Specialists

MARY CLARE SHEAHAN, *61 Westmoreland Road, Barnes, London, SW13 9RZ*; (m.sheahan@kew.org)

Hugh McAllister is prepared to referee *Betula* species; his contact details are already in the Yearbook. He says that if possible he would prefer specimens with mature fruiting catkins, well developed vegetative spur shoot leaves, and long shoots – especially young ones.

Panel of Vice-county Recorders

DAVID PEARMAN, *'Algiers', Feock, Truro, Cornwall, TR3 6RA*; (dpearman4@aol.com)

New recorders and changes:

113(G) Guernsey: Miss K.J. Gilmour, Guernsey BRC, Old Tobacco Factory, Lan Ramee, St Peter Port, Guernsey, GY1 2ET.

113(J) Jersey: Mrs A.H. Haden, Les Deux Ruelles, Le Feuguerel, St Lawrence, Jersey, JE3 1FT.

29. Cambs.: Dr A.C. Leslie, 109 York Street, Cambridge, CB1 2PZ to be sole Recorder. Mr N.P Millar, Recorder since 2001, retires.

48. Merioneth: Mrs S. Stille, The Quillet, Berwyn Street, Llandrillo, Corwen, Denbighshire, LL21 0TH to be sole Recorder. Dr R. Gritten, Recorder since 2010, retires.

60. W. Lancs.: Mr D.G. Earl, 25 Outram House, St Mary's Avenue, Walton-le-Dale, Preston, Lancs., PR5 4UR. Mr E.F. Greenwood, Recorder since 1964, retires.

86. Stirling: Miss R. McGuire, 20 Crichton Drive, Grangemouth, FK3 9DF & Mr P. Sansum. Mrs E.W. Stewart, Recorder since 1994, retires.

96. Easterness: Mr A. Fraser, 15 Balmacaan Road, Drumnadrochit, IV63 6WR to be sole Recorder. Miss S. Smyth, Recorder since 2007, retires.

99. Dunbarton: Mrs P. Murdoch, 58 Prestonfield, Milngavie, Glasgow, G62 7PZ to be sole Recorder. Dr J. Holland, Recorder since 2007, retires.

I would like to thank those retiring for their sterling efforts over so many years. This simple thanks seems so inadequate after often 30 or more years of help, and we could not do what we do without that entirely voluntary help.

Change of address:

56 Nottinghamshire: David Wood has moved to 78 Alford Road, Edwalton, Nottingham, NG12 4AU.

Scottish vice-county recorder vacancies: Easterness & Dunbarton

JIM MCINTOSH, *BSBI Scottish Officer, Royal Botanic Garden, 20A Inverleith Row, Edinburgh, EH3 5LR*; (jim.mcintosh@bsbi.org.uk)

The Scottish Committee are looking for keen, fit botanists to fill vice-county recorder vacancies in Easterness and Dunbarton. The appointments are likely to be joint with existing (joint) recorders, as this has many advantages, such as mutual support, a shared workload, learning from each other, *etc*. Living in or near the vice-county is an advantage, but is not essential – some recorders live remotely and operate very successfully. But you would have to be able to spend significant time in the vice-county each year; perhaps three weeks survey time per year.

Good recorders are critical to the BSBI's success. The focus for all recorders is helping to fulfil the aims set out in the BSBI's

Recording the British and Irish flora 2010-2020. The principal task is the collection, validation and maintenance of vascular plant records in the vice-county on behalf of the BSBI. Being a reasonably competent botanist is important, but knowing one's limits is even more so. No one can be an expert in all aspects of a county's flora – especially when just starting out as a recorder, and our referees are on hand to support and help on identifications and confirmations.

You would have the full support of the BSBI Scottish Committee, Scottish Officer and fellow BSBI staff. Neighbouring and retiring recorders are always happy to help with general advice and support. Competency with computers, particularly e-mail, the internet and MapMate, would be highly desirable (although some training can be provided).

Easterness, v.c.96

Easterness is the largest vice-county in the British Isles and one of the most important in Scotland. It is enormously varied, and includes coastal, riparian, semi-natural woodland, moorland and montane habitats – as well as a large part of the Cairngorm National Park. These montane habitats hold several important populations of rare species such as *Carex lachenalii* (Hare's-foot Sedge), *Carex rariflora* (Mountain Bog-sedge), *Saxifraga rivularis* (Highland Saxifrage), *Salix lanata* (Woolly Willow) and *Phyllodoce caerulea* (Blue Heath). Fen habitats host *Carex buxbaumii* (Club Sedge) and *Carex chordorrhiza* (String Sedge), whilst the woodlands provide habitat for *Moneses uniflora* (One-flowered Wintergreen) and *Linnaea borealis* (Twinflower). Inverness was the subject of a major project that resulted in the publication of the excellent *Map flora of mainland Inverness-shire* in 1985.

Dunbarton, v.c.99

Despite being the third smallest Scottish vice-county, it has the sixth highest number of species. It straddles the Highland boundary fault, with low and fertile ground to the south, and more mountainous terrain to the north, culminating in Ben Vane and Ben Vorlich - its highest point at 941m. It includes Loch Lomond, Britain's largest freshwater lake, and much of the Loch Lomond and the Trossachs National Park. Apart from Loch Lomond and its islands, its key natural features are its extensive Atlantic oakwoods, the River Leven and the Clyde Estuary. It holds important populations of *Callitriche palustris* (Narrow-fruited Water-starwort), *Carex elongata* (Elongated Sedge), and *Rumex aquaticus* (Scottish Dock). Some 60,000 v.c.99 records have been digitised by the Scottish Computerisation Project in recent years.

If you are interested in either of these vacancies, or would like to register a general interest in Scottish vacancies that arise from time to time, please e-mail me with your c.v. by 30th June.

The use of sampling in recording for the next *Atlas*

JIM MCINTOSH, *BSBI Scottish Officer, Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR*; (Tel.: 0131 248 2894 or 0791 7152580; jim.mcintosh@bsbi.org.uk)

The main aim set out in the BSBI's *Recording the British and Irish flora 2010-2020*[1] is a comprehensive update of hectads between 2000-2019, in preparation for a third atlas; an ambitious aim, especially at tetrad or better resolution and with all the other things we ask recorders to do! (Not to mention recorders' own interests and projects.)

Most recorders have a local plan of action and recording activity is well underway. However, others have yet to formulate a plan. Recorders must now begin to think about how they will achieve that comprehensive update of hectads, and still leave time for other things, whether related to botany or not! It is not too late, as long as you start now!

Only the very smallest vice-counties, or those with great densities of botanists, can hope to achieve 100% coverage at monad or tetrad level in this timescale. In medium to large vice-counties, a much better approach is to select and survey a *sample* of squares.

Various issues and approaches are discussed in the *BSBI guidance on sampling approaches* [2]. What follows is a short summary of its key points.

Perhaps the most critical aspect is that any sampling approach must be *enjoyable*. If it is not, recorders will not stay the course. A key decision is what resolution of recording to adopt. It is not necessarily true that if you have a big county you should opt for a larger grid square (*e.g*. tetrad). Given that you only have a finite amount of time for recording, you are generally not going to cover more ground if you choose tetrads over monads. It is probably still worth stating, even if obvious, that it is much better to have a few very thoroughly botanised squares than many that have only been poorly covered.

Another major decision is how to select squares for survey. Should the selection be random, systematic or a mixture of both? A systematic approach was used for the Monitoring Scheme (*e.g*. AJW tetrads). Or should the selection be entirely subjective - for example by only choosing the richest squares? Each has its advantages and disadvantages. Unbiased surveys are great for recording common plants and habitats, but miss more localised species and can be less interesting to record. On the other hand, targeted surveys are better at locating rarer species, but less suitable for analysing change, because the results are likely to be biased.

As a rule of thumb, sampling just three randomly selected tetrads in a hectad will find 50% of the species present in that hectad. If you choose the richest three tetrads, the figure rises to 70%. Quentin Groom has now done some further work, which shows that a sample of nine random monads will find 50% of the species present in the hectad; or if the richest nine monads are surveyed, approximately 70% of the species in the hectad will be found. Of course, the law of diminishing returns applies, and surveying six random tetrads won't find 100% of the species! However, it does demonstrate the usefulness of sampling for reducing workloads to manageable levels.

Another important consideration is the number, availability and expertise of contributing botanists. Each Recorder must decide which mix of strategies is most suitable for them and their vice-county, based on geography and such local circumstances. A clear local recording plan of action will help to encourage and focus effort by recorders and contributors. It also provides, rather importantly, a means of measuring progress.

[1] Available on the BSBI website from the Resources page: www.bsbi.org.uk/resources.html
[2] Also available on the Resources page.

NOTES FROM THE OFFICERS

From the Hon General Secretary – *LYNNE FARRELL*

41 High Street, Hemingford Grey, Cambs., PE28 9BJ
(01480 462728) (lynneonmull@btinternet.com)

There is a great deal of activity within the Society at the present time, much of which you can read about in other articles in this edition of *BSBI News*. Below are just a few of the changes.

I would like to thank all the retiring members for their help in the past and I hope that they will continue to be very much part of the Society.

Committee changes:

1. Meetings Committee: Retiring – John Bailey, Neil Crossman, John Swindells. Nominated – Sue Townsend, Louise Marsh. (Please note that the new secretary for this committee is Jonathan Shanklin jdsh@bas.ac.uk)
2. Records Committee: Retiring – Michael Braithwaite. Nominated – Martin Rand.

3. Publications Committee: Retiring – none. Nominated – John Edgington.
4. Training & Education Committee: Retiring – none. Nominated – Mark Duffield.
5. Science & Research Committee: Retiring – none. Nominated – none.

Dates for meetings

People often ask me about dates for meetings. These are listed in the *Yearbook* and various Committee, AGM and Annual Exhibition Meeting dates are also shown in the Diary for 2013, which is included here in *BSBI News* (see p. 80).

Annual Exhibition Meeting request for photographs and information

Owing to the success of recent indoor meetings, we are looking forward to the AEM in London on 23rd November this year, where the theme will be 'Plants, Publicity and People'.

The Meetings Committee are hoping to use some of the photographs of botanical members found in our archives at the Natural History Museum, and to add to this, some more recent photos of our members. If you have any which you would be willing to share, then either myself or Louise Marsh would be pleased to receive them. These could be of yourself or your botanical acquaintances. A few words about the photos would be appreciated.

From the Scottish Officer – *JIM MCINTOSH*

c/o Royal Botanic Garden, 20A Inverleith Row, Edinburgh, EH3 5LR;
(Tel: 0131 2482894 or 0791 7152580; jim.mcintosh@bsbi.org.uk)

Getting a new computer? – *Windows 8*

I don't normally give advice on operating systems, but when it comes to a new computer or laptop with the new *Windows 8*, I would strongly urge you to 'try before you buy'. Recorders should note that MapMate is not currently recommended on Windows 8. Although from limited personal experience, I am not aware (yet) that *MapMate* works any differently in *Windows 8* than in *Windows 7*. But the dual user interface and the seemingly erratic switching between them can be hard to contend with – particularly if you have a trackpad and no separate mouse. Also, once you do find the classic desktop, there is no 'start' button and consequently no start menu and 'shutdown' option!

If you decide you would prefer the conventional Microsoft desktop interface only, then it is still possible to buy machines with *Windows 7*, but you may have to order on-line. However, if you do buy a *Windows 8* machine, there are a couple of little modifications which you may find useful. You can download software called *Classic Shell* (www.classicshell.net), which will re-instate your start button and menus (and optionally also classic Explorer and classic Internet Explorer 9). If you have bought a laptop, you might also find disabling some of its trackpad functions results in a more stable interface. On many machines, there are options somewhere under 'mouse' in the Control Panel.

By the way, recorders, if you do encounter problems using *MapMate* on a *Windows 8* machine, please let us have details.

Anti-virus software

The pre-installed *Microsoft Security Essential* software in *Windows 7* and *Windows 8* is the most highly rated of any AV software – including both free and paid programmes – according to a recent *Which?* report. It's entirely free, with no subscription. So, you may like to save some money by not buying the anti-virus software that computer shops always like to flog with new machines.

From the acting Welsh Officer – *PAUL GREEN*

c/o Biodiversity & Systematic Biology, National Museum of Wales, Cardiff, CF10 3NP;
(Tel.: 02920 973152; welshofficer@bsbi.org.uk)

Hello! My name is Paul Green (see photo, inside back cover). If you don't already know, I am covering Polly Spencer-Vellacott while she is on maternity leave. I have been in my post since early November 2012. I am based in Cardiff Museum. You should have read about this in *BSBI News*, **122** but, somehow, the note I wrote for that issue is floating around in cyberspace.

You may be surprised to read that I am working in Wales when many of you would associate me with Ireland for the publication of the *Flora of County Waterford* in 2008 and, before that, the publication of *The Atlas flora of Somerset* in 1997, joint author with my twin brother Ian and Geraldine Crouch. Long before then, back in 1984, our Gran took my brother and I to a weekly evening class on botany at Somerton, Somerset, that our now BSBI Administrative Officer Dr Clive Lovatt ran. I remember taking a plant along of *Mercurialis annua* (Annual Mercury) from the garden to ask Clive what it was; also taking Clive to see a clump of *Pseudofumaria alba* (Pale Corydalis) growing on a bank in a wood on Hatch Hill, to see if he could name it for us. This was a new county record. At the end of the course Clive gave us a copy of C.E. Hubbard's book on grasses saying he thought we would get much use from the book!

Surveying rare Welsh plants

One of my jobs this year will be surveying rare Welsh species across Wales on SSSIs and elsewhere. I will be targeting *Antennaria dioica* (Mountain Everlasting), *Hammarbya paludosa* (Bog Orchid), *Trollius europaeus* (Globeflower) and hopefully *Pseudorchis albida* (Small-white Orchid) and *Orthilia secunda* (Serrated Wintergreen), if time permits. Another species, *Matthiola sinuata* (Sea Stock), I will be surveying on Kenfig and the Gower. As it is an easy species to recognise, I will be aiming to get beginners involved.

Threatened Plant Project (TPP)

We also plan to finish mopping up the remaining chosen sites for TPP species across Wales this year. There are not many sites left to be surveyed. Hopefully all sites can be done!

Would you like to help survey Welsh rare plants?

If you would like to join me at any time during the year please e-mail or phone me. If you would like to learn how to survey a rare Welsh plant and fill in the recording form used, you are very welcome to join me. I will be out in the field most weeks, depending on time of year and weather, as to where I will be and which species I will be hoping to survey.

Why not visit Wales for a recording holiday?

Have you ever thought about taking a holiday in Wales to do plant recording! Like many parts of Britain and Ireland, Wales has areas that are still under recorded. The Welsh vice-county recorders would very much appreciate help and can point you to areas of their counties that need work as well as give you details of interesting places and plants to see.

Wales Wildflower Day

On Sunday 14th July the National Botanic Garden of Wales, Llanarthne, Carmarthenshire are to hold a Wales Wildflower day. There will be a hay meadow full of flowers to visit. Plenty will be going on for the visitor to see and engage with, from poets, painters, photographers, to craft makers, wood turners *etc*. A new display of Welsh arctic-alpines will be launched. There will be guided walks in the hay meadows, and lastly I will be there as 'Ask the plant ID man'. I will have a display of the everyday tools of the trade I use to help me name plants. Hopefully, the public will bring along plants for me to identify for them. We will also have a display about the BSBI to encourage new membership. Why not come along and help promote the BSBI and have a great day out at the same time!

From the Irish Officer – *MARIA LONG*

c/o National Botanic Gardens, Glasnevin, Dublin 9, Ireland;
(Tel.: 00 353 87 2578763; email: maria.long@bsbi.org.uk)

Over the last few months things have been very busy behind the scenes. A new office space has been set up, and much work has been done in getting the position of Irish Officer truly up and running. We even have a website just for Ireland now. While this is still in development, and so is still quite simple, it will be added to over time. I hope that it will become a valued source of information.

One of the key events organised so far has been a two-day MapMate course for vice-county recorders (VCRs). This was well-attended, and will form a good building-block for future recording and data submission. VCR home visits have been taking place, along with 'structured' phone calls. These fulfil many functions, not least to continue to build the relationship between the Irish Officer and the VCRs. Additionally, record storage, data entry, recording plans, and many other issues are discussed.

Some opportunities have arisen to promote the BSBI to new audiences – *e.g.* speaking to students in the Botany Society in NUI Galway – and many more are being planned. It is hoped that this will, over time, result in a trickle (maybe even a flood!) of new members and recorders.

Work is also underway behind the scenes to get a 'project' up and running as soon as possible in Ireland. Whatever form this takes, it will certainly feed into the work for the Atlas (2020), and the feeling from many of the recorders is that they are looking forward to a focus and a structure for their plant recording.

Our field meetings schedule for this year looks very exciting, with three meetings focused on training; and finally, most of our newest VCRs wrote a short paragraph about themselves for the latest edition of *Irish Botanical News* – and overall, this edition is well worth checking out. It's one of the biggest ever, and has lots of news from Ireland!

CONTRIBUTIONS INTENDED FOR *BSBI NEWS* 124
should reach the Receiving Editor before August 1st

The General Editor Gwynn Ellis can be contacted by answerphone or fax on 02920 496042
email: rgellis@ntlworld.com / membership@bsbi.org.uk
The Receiving Editor Trevor James can be contacted by phone on 01462 742684 or email trevorjjames@btinternet.com

BSBI News (ISSN 0309-930X) is published by the Botanical Society of the British Isles
Enquiries concerning the Society's activities and membership should be addressed to: The Hon. General Secretary, c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London SW7 5BD Tel: 0207 942 5002.
Camera ready copy produced by Gwynn Ellis and printed by J. & P. Davison, 3 James Place, Treforest, Pontypridd, Mid Glamorgan CF37 1SQ (Tel. 01443-400585; email: davison.litho@talktalkbusiness.net)

ADMINISTRATION and IMPORTANT ADDRESSES

PRESIDENT (to June 2013) **Mr Ian Bonner**
Cae Trefor, Tyn y Gongl, Anglesey, LL74 8SD
Tel. 01248 852651 bsbi@caetrefor.co.uk

PRESIDENT (from June 2013) **Dr Ian Denholm**
4 High Firs Crescent, Harpenden, Herts., AL5 1NA
Tel.: 01582 760180 (home), 07974 112993 (mobile); ian.denholm@rothamsted.ac.uk

HON. GENERAL SECRETARY **Miss Lynne Farrell**
41 High St, Hemingford Grey, Cambs, PE28 9BJ
Tel.: 01480 462728; lynneonmull@btinternet.com

HON. TREASURER **Mr Antony Timmins**
154A Warley Hill, Brentwood, Essex, CM14 5HF
Tel.: 01277 202545; antony.timmins@hotmail.co.uk

MEMBERSHIP SECRETARY (**Payment of Subscriptions** and changes of address) & **Mr Gwynn Ellis**
***BSBI NEWS* GENERAL EDITOR** **41 Marlborough Road, Roath, Cardiff, CF23 5BU**
(Please quote membership number on all correspondence; see address label on post, or Members List)
Answerphone & Fax. 02920 496042; membership@bsbi.org.uk; rgellis@ntlworld.com

HON. FIELD SECRETARY (including enquiries about Field Meetings) **Dr Jill Sutcliffe**
Ingrams Farm, Fittleworth Road, Wisborough Green, Nr Billingshurst, West Sussex, RH14 0JA
Tel.: 01403 700395; Jillsutcliffe1@gmail.com

HON. ASSISTANT SECRETARY (General enquiries) **Roy Vickery**
BSBI c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD
Tel.: 0208 6756740; vickery330@btinternet.com

PANEL OF VICE-COUNTY RECORDERS (Comments and/or changes of address) **Mr David Pearman**
Algiers, Feock, Truro, Cornwall, TR3 6RA
Tel.: 01872863388; dpearman4@aol.com

PANEL OF REFEREES & SPECIALISTS (Comments and/or changes of address) **Dr Mary Clare Sheahan**
61 Westmoreland Road, Barnes, London, SW13 9RZ
Tel.: 020 8748 4365; m.sheahan@kew.org

***NEW JOURNAL OF BOTANY*- RECEIVING EDITOR** **Dr Richard Gornall**
Biology Dept., University of Leicester, Leicester, LE1 7RH
Tel. 0116 252 3394; njb@bsbi.org.uk

***NEW JOURNAL OF BOTANY* - BOOK REVIEWS EDITOR** **Dr John Edmondson**
243 Pensby Road, Heswall, Wirral, CH61 5UA
Tel: 0151 342 8287; a.books@mac.com

***BSBI NEWS* RECEIVING EDITOR** **Mr Trevor James**
56 Back St, Ashwell, Baldock, Herts, SG7 5PE
Tel 01462 742684; trevorjjames@btinternet.com

HEAD OF RESEARCH & DEVELOPMENT **Dr Kevin Walker**
97 Dragon Parade, Harrogate, North Yorkshire, HG1 5DG
Tel 01423 538553 or 07807 526856; kevinwalker@bsbi.org.uk

BSBI CO-ORDINATOR & Research Fund applications **Mr Alex Lockton**
6 Teynham Road, Whitstable, Kent, CT5 2EF
Tel. 01227 639365; coordinator@bsbi.org.uk

BSBI PROJECTS OFFICER **Mr Bob Ellis**
11 Havelock Road, Norwich, NR2 3HQ
Tel.: 01603 662260; bob@elymus.demon.co.uk

BSBI SCOTTISH OFFICER **Mr Jim McIntosh**
Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR
Tel.: 0131 248 2894; jim.mcintosh@bsbi.org.uk

BSBI WELSH OFFICER (acting) **Mr Paul Green**
c/o Welsh National Herbarium (NMW), Dept. Biodiversity & Systematic Biology,
National Museum Wales, Cardiff, CF10 3NP;
Tel.: 02920 973152 (Direct line); 0772111113 (mobile); welshofficer@bsbi.org.uk

BSBI IRISH OFFICER **Dr Maria Long**
National Botanic Garden, Glasnevin, Dublin 9, Ireland
Tel.: 00 353 87 2578763; Maria.long@bsbi.org.uk

BSBI DATABASE OFFICER **Mr Tom Humphrey**
3 Upper West Grove, Manchester, M13 0BB
tom@herbariumathome.org

BSBI ADMINISTRATIVE OFFICER (All financial matters **except Membership**) **Dr Clive Lovatt**
57 Walton Road, Shirehampton, Bristol, BS11 9TA
Tel.: 07513 458921; accounts@bsbi.org.uk

BSBI PUBLICATIONS **Mr Paul O'Hara**
c/o Summerfield Books, Unit 12, Skirsgill Business Park, Penrith, Cumbria, CA11 0FD
Tel 01768 210793; Fax 01768 892613; info@summerfieldbooks.com

BSBI WEBSITE ADDRESS www.bsbi.org.uk

Registered Charity Number in England & Wales: 212560 and in Scotland: SC038675

Blysmus rufus, Birkdale Green Beach, v.c.59. Photos P.H. Smith © 2010 (see p. 55)

Leafy sterile 'clump' of *V.* ×*intersita* (fig. 2), showing hybrid vigour and standing out in the short turf of the dunes, with sterile heads (fig. 1) inset left; Aberffraw, v.c.52. Photos: M. Wilcox © 2010 and inset right (fig. 3), developing capsules of *Viola reichenbachiana*, Sapcote, v.c.55. Photo G. Calow © 2009 (see p. 29)

Photo 1 (inset): *Carex maritima* on a roadside between Borve and Scarista, South Harris. Photo E. Pilling © 2007. Photo 2.: Former sand quarry in dunes at Borvemor. In 2006 its floor was covered by *Carex maritima*. Photo P.A. Smith © 2006 (see p. 27)

Photo 3: Horsacleit: *Carex maritima* roadside habitat. Photo 4 (inset): *C. maritima* growing in roadside gravel – flowering spike arrowed. Both photos P.A. Smith © 2012 (see p. 27)

Photo 5: Cnoc Torravig: *Carex maritima* roadside habitat. Photo 6 (inset): *C. maritima* growing with *Juncus bufonius* – flowering spikes arrowed. Both photos P.A. Smith © 2011 (see p. 27)

Fig. 1. Heterophylly in a green Sycamore

Fig. 4. Heterophylly in a purple Sycamore.

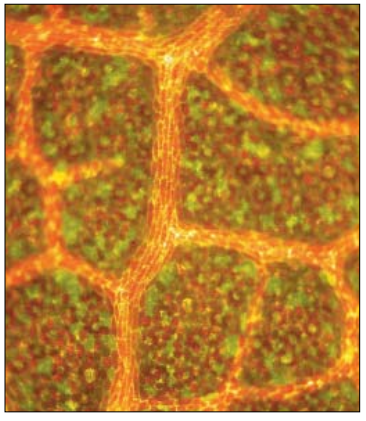


Fig. 5. Purple Sycamore under-leaf tissues. Mesophyll chromoplasts rounded, 12-18µ in diameter. Living tissues, actual colours

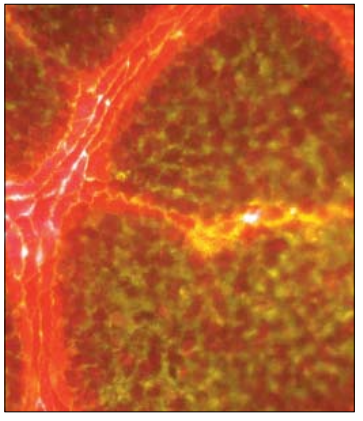


Fig. 6. Copper Beech leaf tissues. Mesophyll chromoplasts 12-18µ, irregular outlines. Living tissues, actual colours.

All photos taken near Marlborough, Wilts. by J. Oliver © 2012 (see p. 38)

Alistair Godfrey, Angus Hannah and David Hawker admiring clumps of *Artemisia stelleriana* at Mersehead, v.c.73.
Photo: C. Crawford © 2012 (see p. 77)

Scottish Recording Week at Orroland: doing specimens after a day in the field. Photo H. Hawker © 2012 (see p. 77)

Fig. 1. *Primula vulgaris* ssp. *sibthorpii* in the Botanic Gardens, Glasnevin, Dublin.
Photo T.J. McCloughlin © 2010 (see p. 51)

Figs 2 (l) & 4 (r). A pink primrose occurring within a drift of 'normal' *Primula vulgaris* in a hedgerow in the townland of Taughman, Co. Westmeath.
Photos T.J. McCloughlin © 2010 (see p. 51)

Arum maculatum (Lords-and-ladies) inflorescences nibbled by Muntjac, West Wood, Wilts.
Photo J. Oliver © 2012 (see. p. 35)

Pressed leaf of *Pulsatilla vulgaris* (Pasqueflower) infected by the smut fungus *Urocystis pulsatillae*, collected on 1st August 2012 from Therfield Heath, Herts., showing clusters of ruptured blisters (sori) releasing powdery masses of blackish smut spores. Photo M. Ainsworth © 2012 (see p. 74)

Plate 1. Putative *Limonium* ×*neumanii* at Marshside, north Merseyside (v.c.59), August.
Photo P.H. Smith © 2010 (see p. 9)