Short Notes

ANTHYLLIS VULNERARIA L. SUBSP. *POLYPHYLLA* (DC.) NYMAN, AN ALIEN KIDNEY-VETCH IN BRITAIN

Anthyllis vulneraria (Kidney-Vetch) is a most variable species, both in Britain and Ireland and in Europe. Five subspecies have been recognized in these islands (Cullen 1976, 1986; Akeroyd 1988), three of them native: subsp. *vulneraria*, the most widespread variant, subsp. *lapponica* (Hyl.) Jalas, in Scotland and northern and western Ireland, mainly in the mountains and near the coast, and subsp. *corbieri* (Salmon & Travis) Cullen, a rare plant of coastal cliffs and sand-dunes in western Britain. Two other subspecies, subsp. *carpatica* (Pant.) Nyman and subsp. *polyphylla* (DC.) Nyman are adventive, both perhaps introduced in forage and amenity plantings. In recent years, subsp. *carpatica* (present in Britain and Ireland as var. *pseudovulneraria* (Sag.) Cullen) has expanded its range considerably in Britain, although apparently less so in Ireland (Scannell & Synnott 1987), mainly as a plant of grass and legume mixtures sown on new road verges, embankments and roundabouts. Subsp. *polyphylla*, on the other hand, is now a scarce and perhaps extinct plant in Britain – it has not been reported from Ireland – although it was collected or recorded in several localities from Dorset to Moray in the 1950s to the 1970s. There are no records after 1973.

A. vulneraria L. subsp. *polyphylla* (DC.) Nyman, *Consp. Fl. Eur.* 164 (1878)
Short-lived perennial. Stems 30–50 cm, erect, pubescent with appressed to patent hairs or more or less glabrous below, glabrous above. Basal and lower cauline leaves inequifoliate, with 3–5 pairs of lateral leaflets; upper cauline leaves subequifoliate, with 3–6(–7) pairs of leaflets. Inflorescences usually several on each stem, some lateral and sessile. Calyx rather narrow, concolorous (i.e. without a red tip), the hairs appressed. Corolla yellow.

I have traced the following records:
v.c. 9, Dorset. Briantspuddle, parish of Alfpuddle, roadside, 3.7.62, *T. Woodisse 1*, **BM**.
v.c. 22, Berks. Maidenhead, by A423 at junction of M4 (GR 41/88.78), grass bank on chalk, 12.6.66, *I. K. Ferguson 1378*, **TCD**.
v.c. 23, Oxon. Near Thame, chalk pit, 7.6.64, *J. Rogerson*. Intermediate between subsp. *polyphylla* and subsp. *vulneraria*, det. J. Cullen. B.R.C. card.
v.c. 29, Cambs. Near Burwell (GR 52/575.653), bank of old railway line, 22.6.66, *P. D. Sell 66/26*, **CGE** (reported in Crompton & Wells 1990).
v.c. 51, Flints. Melinden, 1 km south of Prestatyn (GR 33/169.801), limestone quarry, 29.5.61, *R. K. Brummitt, J. Cullen & P. E. Gibbs 61.195*, **LIV**; Trelogan (GR 33/12.80), rough grass, *K. S. Kandall*, det. J. Cullen. B.R.C. card.
v.c. 85, Fife. Tentsmuir, Long Road (near Poles' Camp), *E. Crapper*, 26.7.56, **STA**; near Kinshaldy, edge of Tentsmuir forest (GR 37/48.23), in hayfield, chiefly *Lolium*, 30.7.65, *A. Angus 5176*, **STA**.
v.c. 89, E. Perth. c.1/2 mile south of Pitlochry (GR 27/95.57), main road embankment, 12.7.66, *M.McC. Webster 10738*, **BM**, **RNG**.
v.c. 95, Moray. Near Randolph's Leap, Dunphail, road-verge, 3.7.61, *M.McC. Webster 5965*, **ABN**, **CGE**, **E**, **RNG**; Elgin, golf course, car-park, 12.8.70, *M.McC. Webster 13335*, **CGE**; Whitemire (GR 28/98.54), bank by road, 18.6.73, *M.McC. Webster*, **CGE**.
v.c. 96, Nairn. Near Kilravock, road verge, 1.8.62, *M.McC. Webster*, **CGE**; Auldearh (GR 28/9.5), station yard, 9.6.67, *M.McC. Webster 11266*, **ABN**, intermediate between subsp. *polyphylla* and subsp. *vulneraria*; Allanburn, Newton Hotel, 27.6.63, *M.McC. Webster*, **CGE**.

Comparative descriptions of the five British subspecies are given in Akeroyd (1988), and they have been illustrated by Stewart (1987). Perhaps the most obvious feature of subsp. *polyphylla* is the

many pairs of lateral leaflets of the basal and lower cauline leaves. The most similar of the other subspecies in Britain is subsp. *carpatica*, which differs mainly in the inequifoliate cauline leaves and the more swollen calyx with somewhat spreading hairs. The tall, erect habit of both subspecies is distinctive in the field.

The erect habit reflects the sometime use of subsp. *carpatica* and subsp. *polyphylla* as forage plants that can be cut readily during hay-making. This growth habit is in contrast to the often prostrate or weakly ascending habit of subsp. *vulneraria* and subsp. *lapponica* in natural and semi-natural grassland. A similar pattern of differentiation exists between *Medicago sativa* L. subsp. *sativa* (Alfalfa or Lucerne) and subsp. *falcata* (L.) Arcangeli (native variant), and forage versus native variants of several other legumes, for example *Lotus corniculatus* L. (Bonnemaison & Jones 1986), *Trifolium pratense* L. (Williams 1927) and other clovers, and *Onobrychis viciifolia* Scop. (D. E. Coombe pers. comm.).

About half the British records of *A. vulneraria* subsp. *polyphylla* are from road verges, which suggests that the plants were sown deliberately or accidentally as part of a legume and grass mixture. I have not observed subsp. *polyphylla* in the field in Britain, but have frequently observed subsp. *carpatica*. Typical associates include a tall, erect, fistulose-stemmed variant of *T. hybridum* L. and robust, erect variants of *T. pratense* L. and *T. repens* L., which suggest the deliberate sowing of legumes derived from forage sources, probably the most readily available seed. The native distribution of *A. vulneraria* subsp. *carpatica* var. *pseudovulneraria* has perhaps been obscured by a history of cultivation (Cullen 1976), but the subspecies is generally central European in its distribution. Subsp. *polyphylla* is a plant of central and eastern Europe, and it therefore appears that central Europe may be the source of seed used in at least some roadside landscaping. The use of seed from other regions in road verge plantings has been documented in Finland (Suominen 1974), and the practice has attracted some attention from botanists in Britain in recent years, both from the evolutionary (Bonnemaison & Jones 1986) and the practical and ethical (Dony 1989 and pers. comm.) points of view.

One of the records of *A. vulneraria* subsp. *polyphylla* from Tentsmuir, Fife (v.c. 85), is from a *Lolium* ley, which suggests either the deliberate sowing of subsp. *polyphylla* in a seed mixture or that the plant was present as a contaminant. The other Tentsmuir record, the earliest from Britain, is from near to a former Polish Army encampment, which generates a more colourful hypothesis. Many Polish soldiers, including cavalry units, were stationed in Fife during World War II (as a student in St Andrews in the 1970s I often heard Polish spoken in the town) and it is tempting to postulate that subsp. *polyphylla* was introduced to Tentsmuir with or in the horses' fodder. Many adventive species in Finland were found to be associated with the activities of Russian soldiers and their horses during, and in the decade following, World War II, and several persisted for some years (Niemi 1969).

The peak of records of subsp. *polyphylla* in the mid-1960s may reflect the use of this plant, or its presence as an impurity, in seed mixtures used on the new verges of an expanding and improved road network in Britain. The record from the bank of the recently constructed M4 motorway at Maidenhead may be significant in this respect. The lack of records from the early 1970s to the present, coupled with an increasing number of records of subsp. *carpatica*, may indicate that subsp. *polyphylla* has been replaced in commercial seed mixtures or that the source of these has shifted somewhat. It thus appears to join the list of adventive species that have been only temporarily established in Britain (Salisbury 1961). Nevertheless, the fact that it is a variant of a native species with which it may have hybridized (e.g. the record from Oxon), could mean that traces of its former presence are retained in the gene-pool of *A. vulneraria* in Britain. However, it is not clear to what extent such processes operate in natural populations.

ACKNOWLEDGMENTS

I am grateful to C. D. Preston for help in compiling records and for comments on an earlier draft of the manuscript, and to the late Dr J. G. Dony for discussion of the problems posed by the indiscriminate sowing of alien seed on road verges.

REFERENCES

AKEROYD, J. R. (1988). *Anthyllis vulneraria* L. in RICH, T. C. G. & RICH, M. D. B. *Plant Crib*, pp. 45–46. London.

BONNEMAISON, F. & JONES, D. A. (1986). Variation in alien *Lotus corniculatus* L. 1. Morphological differences between alien and native British plants. *Heredity* **56**: 129–138.

CROMPTON, G. & WELLS, D. (1990). Vascular plant records. *Nature Cambs.* **32**: 77–80.

CULLEN, J. (1976). The *Anthyllis vulneraria* complex: a resumé. *Notes Roy. Bot. Gard. Edinb.* **35**: 1–38.

CULLEN, J. (1986). *Anthyllis vulneraria* L. in the British Isles. *Notes Roy. Bot. Gard. Edinb.* **43**: 277–281.

DONY, J. G. in BRIGGS, M. (1989). Report of Annual General Meeting, 7 May 1988. *Watsonia* **17**: 382–383.

NIEMI, A. (1969). Influence of the Soviet tenancy on the flora of the Porkala area. *Acta Bot. Fennica* **84**: 1–52.

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

SCANNELL, M. J. P. & SYNNOTT, D. M. (1987). *Census catalogue of the Irish flora*, 2nd ed. Dublin.

STEWART, O. M. (1987). *Anthyllis vulneraria* L. (Kidney vetch). *B.S.B.I. News* **46**: 12–15.

SUOMINEN, J. (1974). Maantieluiskanurmetuksista ja tulokaskasveista. *Luonnen Tutkija* **78**: 12–18.

WILLIAMS, R. D. (1927). *Red clover investigations*. Bulletin of the Welsh Plant Breeding Station H7. Shrewsbury.

J. R. AKEROYD
24 The Street, Hindolveston, Norfolk, NR20 5BU

BEVAN'S BITTERCRESS: THE SMALL, WHITE-FLOWERED VARIANT OF *CARDAMINE* × *FRINGSII* WIRTGEN ALSO PRESENT IN BRITAIN

In April 1989, D.B. discovered a striking, white-flowered *Cardamine* (see Bevan 1990) in a flush at Bentley Priory, Middlesex. The plant was robust, uniform and approximately intermediate between *C. flexuosa* With. and *C. pratensis* L. (Table 1), with which it was growing. However, as the plant had small, white flowers rather than the larger, pale lilac flowers usually expected of the hybrid in Britain (Jones 1975), and as *C. pratensis* is very variable (Lovkvist 1956), a hybrid origin of "Bevan's Bittercress" could not be assumed. Further investigation of the Bentley Priory populations was required.

TABLE 1. MORPHOLOGICAL CHARACTERS OF *CARDAMINE* TAXA FROM BENTLEY PRIORY AND OF THE SYNTHESIZED HYBRID
Measurements are ranges made on fresh material.

	C. flexuosa	Bevan's Bittercress	*C. pratensis*	Synthesized hybrid
Height	to 30 cm	to 45 cm	to c. 30 cm	*
Branching	strong below, weak above	weak below, strong above	simple below, weak above	*
Flowering stems	sparsely hairy below	glabrous	glabrous	glabrous
Upper surface of rosette leaves	hairy	glabrous or sparsely hairy when young	glabrous	glabrous or sparsely hairy when young
Petal colour	blade white, claw whitish	blade white, claw greenish	blade purple, pink or white, claw greenish	blade white, claw greenish
length	2·9–4·2 mm	5·2–7·3 mm	9·1–14·2 mm	5·0–7·0 mm
width	1·1–1·5 mm	1·8–2·8 mm	4·5–8·0 mm	2·0–4·2 mm
Sepal length	1·7–2·2 mm	2·2–2·6 mm	3·3–4·6 mm	2·0–3·0 mm
Mean pollen stainability ± S.D.	60% ±6%	0% ±0%	62% ±9·6%	0% ±0%

* Not assessed due to slug damage.

FERTILITY

Pollen viability was investigated using Alexander's Stain. At least 100 pollen grains were counted from six flowers of each *Cardamine* (Table 1). About two-thirds of the pollen grains of *C. flexuosa* and *C. pratensis* took up stain, whilst those of Bevan's Bittercress took up no stain at all. The results suggest that Bevan's Bittercress is pollen-sterile. Note that pollen grains which take up stain are not necessarily viable.

A better test of fertility is to assess seed production, and hence flowers of Bevan's Bittercress were self- and cross-pollinated by hand. Bevan's Bittercress stubbornly refused to set any good seed, even when cross-pollinated with *C. pratensis*. By contrast, seed developed freely in both white- and pink-flowered clones of *C. pratensis* when cross-pollinated. *C. flexuosa* is self-compatible and regularly sets good seed.

CHROMOSOME COUNTS

C. flexuosa has a chromosome number of 2n = 32, and *C. pratensis* has reported aneuploid chromosome numbers ranging from 2n = 16 to 2n = 96; the commonest races in Britain are 2n = c. 56 and 2n = c. 30–32 (Hussein 1955; Dale & Elkington 1974). It was hoped that a chromosome count of Bevan's Bittercress might help clarify its relationships.

Chromosomes were counted in root-tips of *Cardamine* taxa from Bentley Priory, at Leicester University. The chromosome numbers of *C. pratensis* were 2n = 30 (white-flowered clone) and 2n = 32 (pink-flowered clone); that of *C. flexuosa* was 2n = c. 30; and that of Bevan's Bittercress 2n = 32. The results can neither confirm nor rule out a hybrid origin of Bevan's Bittercress.

HYBRIDIZATION EXPERIMENTS

If Bevan's Bittercress arose as a hybrid between local plants of *C. pratensis* and *C. flexuosa*, then it should be possible to synthesize it artificially using the same material. Flowers of *C. flexuosa* were cross-pollinated in bud after removal of the stamens (see Lovkvist 1956) using pollen from white- and pink-flowered clones of *C. pratensis*.

Seed set was erratic and germination even more so. No seed was obtained from crosses with the pink-flowered clone of *C. pratensis*. Seed resulting from pollination with the white-flowered clone gave rise to 21 seedlings, 17 of which were *C. flexuosa* probably resulting from pollen contamination. Two of the remaining four plants flowered in 1990 and were an almost exact match for Bevan's Bittercress morphologically and in pollen fertility (Table 1); they also failed to set seed when pollinated by hand. This is strong evidence in favour of a hybrid origin of Bevan's Bittercress.

CONCLUSIONS

It is concluded that Bevan's Bittercress is *C. flexuosa* × *pratensis* = *C.* × *fringsii* Wirtgen (= *C.* × *haussknechtiana* O. E. Schulz). The name *C.* × *fringsii* Wirtgen (1899) has priority over the more widely known name *C.* × *haussknechtiana* O. E. Schulz (1903) (D. H. Kent, pers. comm. 1991).

Bevan's Bittercress differs from variants of *C.* × *fringsii* previously reported in Britain (cf. Jones 1975), but is almost identical with material from the continent (Schulz 1903). Wirtgen describes the petal colour of *C.* × *fringsii* as lilac (D. H. Kent pers. comm.), whilst Schulz describes it as white. The two colour variants may be derived from different chromosome races of *C. pratensis*.

Specimens have been placed in **herb. T.C.G.R.** and **herb. D.B.**

ACKNOWLEDGMENTS

We wish to thank J. P. Bailey and J. Wentworth, Leicester University for the chromosome counts, and D. H. Kent and E. Nic Lughadha for help with nomenclature.

REFERENCES

BEVAN, D. (1990). *Cardamine flexuosa* × *pratensis* at Bentley Priory, Middlesex. *London Naturalist* **69**: Frontispiece.

DALE, A. & ELKINGTON, T. T. (1974). Variation within *Cardamine pratensis* in England. *Watsonia* **10**: 1–17.

HUSSEIN, F. (1955). Chromosome races in *Cardamine pratensis* in the British Isles. *Watsonia* **3**: 170–174.

JONES, B. M. G. (1975). *Cardamine* L., in STACE, C. A., ed. *Hybridization and the flora of the British Isles*. London.

LOVKVIST, B. (1956). The *Cardamine pratensis* complex. Outlines of its cytogenetics and taxonomy. *Symb. Bot. Upsal.* **14** (2): 5–131.

SCHULZ, O. E. (1903). Monographie der Gattung *Cardamine*. *Bot. Jahrb.* **32**: 548–549.

D. BEVAN* & T. C. G. RICH
**3 Queens Road, Bounds Green, London, N11 2QJ*

THE STATUS OF *PULICARIA VULGARIS* GAERTNER IN BRITAIN IN 1990

The Small Fleabane, *Pulicaria vulgaris* Gaertner, is an annual plant associated with traditionally grazed village greens. The historic distribution of the plant and its decline through this century, together with various ecological studies have been described by Hare (1990). The Small Fleabane is sufficiently rare to be listed in the *British Red Data Book* (Perring & Farrell 1983) and to receive special protection through inclusion on Schedule 8 of the Wildlife and Countryside Act 1981.

The Small Fleabane in Britain is confined to southern England. The major strongholds lie in the south-west of the Hampshire basin with scattered outlying populations in the south of the Thames basin. The plant is present in the administrative counties of Dorset, Hampshire and Surrey but in the Watsonian vice-counties of S. Hants. (v.c. 11), N. Hants. (v.c. 12) and Surrey (v.c. 17).

In 1990 botanists from the Flora Group of the Hampshire and Isle of Wight Naturalists' Trust undertook a review of the status of the plant in Britain. All the areas where the plant has been known in recent years were visited, or were subject to reports from local botanists. At each site the number of plants was counted where practicable, or estimated where present in large numbers. At most sites the location and distribution of the plants were mapped both on 1:10000 O.S. base maps and on sketch maps.

The notion of a 'site' is not entirely appropriate for this species due to the ruderal nature of the preferred habitat and the consequential erratic distribution of plants within a general area from year to year. For convenience sites were defined on an ad hoc basis around the ease of visiting and mapping populations.

The British population of Small Fleabane in 1990 was estimated to be some 10,000 plants spread over ten sites. Seven of these ten sites lay within the borders of the New Forest. One site lay in the Avon Valley to the immediate west of the Forest. The remaining two sites lay in the Thames basin, one in Hampshire, the other in Surrey.

The seven New Forest sites accounted for about 77% of the British plants. With a notable exception, the Forest sites which supported strong populations were located not on the Crown Lands managed by the Forestry Commission but on the verges and greens of adjacent commons to the north-east and west of the Forest. Additional small populations were found towards the south of the Forest.

The Avon Valley site accounted for about 22% of the British plants. This population was counted as a single site although the plant was found over a wide area within a single farm. The majority of plants were found in a trackway with another colony in a smaller nearby track, and three small populations associated with broken ground within hay fields and a garden fruit cage.

The populations of the Forest, combined with that of the Avon Valley, account for over 99% of the British plants. The smaller New Forest sites and the Thames basin sites supported a total of fewer than 60 plants in 1990.

Amongst the Flora Group visiting various sites were botanists who had known individual populations over a number of years; we also had the benefit of being accompanied by Dr T. Hare. The general impression was that 1990 was a relatively good year for the species with strong

populations in most of the traditional strongholds. The prolonged drought was thought to be responsible for the drier sites supporting reduced populations but the relatively wet sites supported strong populations. The presence of two generations of plants was noted, one probably associated with germination in spring, the other with germination after the brief summer rains. The action of Forest ponies occasionally pulling up plants was observed. It was thought the ponies were seeking to eat the Small Fleabane but, finding it unpalatable, were discarding it. The absence of the Small Fleabane from one of its three recent Thames Basin localities was not considered significant. This year the site was not subject to its usual level of grazing and thus the open, trampled sward preferred by the plant had become overgrown by vigorous grasses. A return to grazing and subsequent open ground should revive the population.

Within the New Forest the 1990 population may be compared to the 1985 population. In 1985 the Nature Conservancy Council co-ordinated a census of rare plants in the New Forest. The population of Small Fleabane in 1985 was estimated to be in excess of 106,000 plants. The dramatic decline in the total numbers to the present 7700 in the Forest can be attributed to the change in management of a common on the north-east of the Forest. In the early 1980s this common was subject to heavy use by commerical vehicles which resulted in gross disturbance to the vegetation and soils. Whilst the ruts associated with this use were advantageous to the Small Fleabane the disturbance was otherwise undesirable. By 1990 this use had ceased and many of the former ruts and hollows had disappeared. The population of Small Fleabane in this locality has fallen from an estimated 100,000 plants in 1985 to an estimated 1200 plants in 1990.

Of the 1985 sites only one area was found to have changed to become unsuitable for the Small Fleabane. This was a length of verge that had been excavated to install underground telecommunications equipment. The reinstatement of the verge was such as to destroy the seasonally inundated hollows preferred by Small Fleabane and to replace them by mounded spoil from adjacent ditches. Another of the 1985 sites has also been adversely modified. This is a small green at a road junction that has been planted with an ornamental tree. Given that the Small Fleabane is intolerant of shade it must be expected that this colony will decline as the tree matures.

The traditional practices of turning livestock out onto Forest commons currently maintains suitable habitats for the species, yet the future of the commoning economy is uncertain (New Forest Review Group 1988). The acceptance of the threat to the surviving populations from the cessation of traditional grazings must form the basis of future conservation efforts (Whitten 1990). The Small Fleabane populations in the New Forest should not be assumed to be secure.

ACKNOWLEDGMENTS

The following provided or collated records for the 1990 survey: E. Brooks, F. Burford, G. D. Field, Dr T. Hare, Dr J. R. Moon, J. Ounstead, J. Smith and C. Chatters. Many thanks to the Hampshire Office of the N.C.C. for making available a summary of the 1985 Small Fleabane Survey.

REFERENCES

HARE, T. (1990). Lesser Fleabane– a plant of seasonal hollows. *British Wildlife* **2**: 77–79.
NEW FOREST REVIEW GROUP. (1988). *Report of the New Forest Review Group*. Lyndhurst.
PERRING, F. H. & FARRELL, L. (1983). *British Red Data Book: 1. Vascular Plants*, 2nd ed. Lincoln.
WHITTEN, A. J. (1990). *Recovery: A proposed programme for Britain's protected species*. Nature Conservancy Council, C.S.D. Report No. 1089.

C. CHATTERS
Hampshire and Isle of Wight Naturalists' Trust, 71 The Hundred, Romsey, Hampshire, SO51 8BZ

CAREX × *GAUDINIANA* GUTHNICK – A RARITY?

This hybrid, between *Carex dioica* and *C. echinata*, is known in a number of central and northern European countries but has only twice been reported from Britain and Ireland. The first discovery

was in 1942 by A. W. Stelfox in a bog near Louisburgh in West Mayo (specimens in **BM** and **K**); in 1970 a second site for it was found by I. R. Bonner in Denbighshire. In 1989 Mrs J. A. Green, the present recorder for Denbighshire, who had been trying to establish the locality for this sedge and assess the size of the population, sent specimens to the Natural History Museum for confirmation. These, however, proved inconclusive, and in 1990 Mrs Green invited me to join a party to survey the site, the North Wales Wildlife Trust's Reserve at Gors Maen Llwyd.

Both the reputed parents of *C.* × *gaudiniana* Guthnick were locally abundant in the Reserve, but at first we were confused by what came to be known as "funny *echinata*", a form of that species with the male florets at the base of the terminal spike extending into a recognisable male spike which might be as much as a centimetre long. I had never consciously noted this character before in *C. echinata*, and a later examination of the specimens in **BM** suggested that in Britain it is of rare occurrence. Yet the monographer of *Carex*, Kükenthal (1909), evidently regarded it as the norm for *C. echinata*, for his description (of "*Carex stellulata*") includes the phrase "spiculae 3–5 gynaecandrae, terminalis basi in partem ♂ longe attenuata".

When we at last came upon *C.* × *gaudiniana*, whose very distinct appearance was checked against the precise, if somewhat convoluted, description in Ascherson & Graebner (1904) and perfectly accorded with it, there could be no doubt about our having found the right thing. The true plant forms tight clumps, some 15 cm across, of upright narrow leaves well surmounted by the rigidly erect flowering stems. These resemble tiny tridents, for the terminal male spike, a narrow cylinder up to 12 mm long, is flanked on either side by short, divergent female spikes. Another characteristic is that the male spike frequently has odd female florets embedded in its apex or at points below.

Some dozen plants were spotted in a wet grassy area c. 10 m square and ringed by *Calluna vulgaris* near the middle of the western half of the bog. A pair and a single were seen at two spots in the eastern half. In all three places the hybrid was accompanied by both parents. It is hard to believe that it does not occur elsewhere in Britain and Ireland where *C. dioica* and *C. echinata* are found together, and a look-out should be kept for it.

REFERENCES

ASCHERSON, P. & GRAEBNER, P. (1904). *Synopsis der mitteleuropäischen Flora*, Band 2: 232–233. Leipzig.
KÜKENTHAL, G. (1909). Cyperaceae-Caricoideae, in ENGLER, H. G. A. *Das Pflanzenreich*, **38 (IV.20)**: 228–230. Leipzig.

R. W. DAVID
50 Highsett, Cambridge, CB2 1NZ

THE STATUS OF *OENOTHERA CAMBRICA* ROSTAŃSKI AND *O. NOVAE-SCOTIAE* GATES (ONAGRACEAE)

In 1977 K. Rostański described *Oenothera cambrica* from Pembrey in South Wales, United Kingdom. According to Rostański (1982; Rostański & Ellis 1979) this entity is confined to "Wales, Jersey and southern England", occurring there in "sand-dunes, sandy sea-shores, railway banks and waste places". Work during the past decade towards a thorough revision of *Oenothera* subsect. *Oenothera* has resulted in the reduction of *O. cambrica* to the complex synonymy of *Oenothera biennis* L. This detailed revision of the entire subsection *Oenothera* is in final preparation for publication in 1991 by W. Dietrich, W. L. Wagner and P. Raven. It supports and amplifies the philosophy that was described by Raven *et al.* (1979). This taxonomy provides a classification basically consistent with those applied to other groups of plants, and especially with the other sections of *Oenothera*. The comprehensive work underway for over the past decade has resulted in a classification in which five out-crossing, bivalent-forming species, and eight, essentially clonal, permanent translocation heterozygote species are recognized. In this treatment the permanent translocation heterozygote species are treated rather broadly. They behave essentially like other clonal species, although the mechanism, involving chromosomal translocations, balanced lethals, and self-pollination, is anomalous (for summary see Cleland 1972; Holsinger & Ellstrand 1984).

Each of these entities is comprised of a few to numerous true-breeding phenotypes that share common genetic and certain related phenotypic characteristics. *Oenothera biennis* is the most polymorphic and widespread of the eight permanent translocation heterozygote species of subsection *Oenothera* and consists of a large number of minor phenotypes, of which *O. cambrica* is one that originated from naturalized populations of *O. biennis* from North America.

Rostański (1985), after examining a specimen in **BM** annotated by R. R. Gates as *Oenothera novae-scotiae* Gates (Cult. at Regent's Park, London, *Gates 51/35*), decided that his earlier described *O. cambrica* represented the same entity as this specimen. He therefore adopted *O. novae-scotiae* for these plants. Rostański, however, did not examine the type of *O. novae-scotiae* from Nova Scotia, Canada (*Gates s.n.*, UC–193440, holotype) indicated in the original publication by Gates (1918). I have examined the holotype and it does not represent *O. cambrica* (= *O. biennis*), but rather a quite distinct North American species with subterminal sepal-tips, *O. parviflora*, which is also naturalized in Europe. *Oenothera parviflora* is known in Great Britain from scattered collections in and near Glamorgan, Wales (Rostański 1982).

Thus, the names *O. cambrica* and *O. novae-scotiae* should not be placed together. *Oenothera cambrica* represents a phenotype of *O. biennis* with red pustulate-based hairs, a trait that is widely variable in the indigenous range of this species. *Oenothera novae-scotiae* represents *O. parviflora*. European workers who have not adopted the taxonomic philosophy discussed above for subsect. *Oenothera* should refer to the plants with small flowers, terminal sepal-tips and red pustulate-based hairs from Great Britain as *Oenothera cambrica*.

REFERENCES

Cleland, R. (1972). Oenothera *cytogenetics and evolution*. London.

Gates, R. R. (1918). A new evening primrose. *Oenothera novae-scotiae*. *Trans. Nova Scotia lit. Soc.* **14**: 141–145.

Holsinger, K. E. & Ellstrand, N. C. (1984). The evolution and ecology of permanent translocation heterozygotes. *Am. Nat.* **124**: 48–71.

Raven, P. H., Dietrich, W. & Stubbe, W. (1979). An outline of the systematics of *Oenothera* subsect. *Euoenothera* (Onagraceae). *Syst. Bot.* **4**: 242–252.

Rostański, K. (1977). Some new taxa in the genus *Oenothera* L. subgenus *Oenothera*. Part III. *Fragm. flor. geobot.* **23**: 285–293.

Rostański, K. (1982). The species of *Oenothera* L. in Britain. *Watsonia* **14**: 1–34.

Rostański, K. (1985). Zur Gliederung der Subsektion *Oenothera* (Sektion *Oenothera*, *Oenothera* L., Onagraceae). *Feddes Repert.* **96**: 3–14.

Rostański, K. & Ellis, G. (1979). Evening Primroses (*Oenothera* L.) in Wales. *Nature Wales* **16**: 238–249.

W. Dietrich

Botanischer Garten der Universität Düsseldorf, Universitätsstrasse 1, D-4000 Düsseldorf 1, Germany

A NEW VARIANT OF *OPHRYS APIFERA* HUDSON IN BRITAIN

On 20 June 1990, during a visit to Oxwich Burrows N.N.R. in Glamorgan, v.c. 41, I found a group of abnormal Bee Orchids (*Ophrys apifera* Hudson) in the dune slacks. This group included ten abnormal and four normal plants growing in an isolated slack.

The abnormal plants were all robust, about 310 mm tall, with an inflorescence 200 mm in length containing about ten florets. Most were fully expanded, about two were in bud and a further one had failed to develop. There were three sheathing stem leaves, and the lowest bract measured 45 mm in length. All the perianth segments were entire, pink in colour with a strongly marked green central vein and two or more paramedian veins. The three inner perianth segments were slightly crinkled, but otherwise resembled the outer perianth segments (Fig. 1). Measurements of length and maximum width of the segments of a specimen floret were as follows: dorsal outer segment 16 × 8·5 mm, lateral outer segments 16·5 × 8 mm and 16·5 × 7·5 mm; ventral inner segment 15·5 × 8·5 mm, lateral inner segments 16 × 7·5 mm. The column appeared normal, with well developed pollinia and evidence of self pollination. There is a high frequency of autogamy in *Ophrys apifera*, which enables

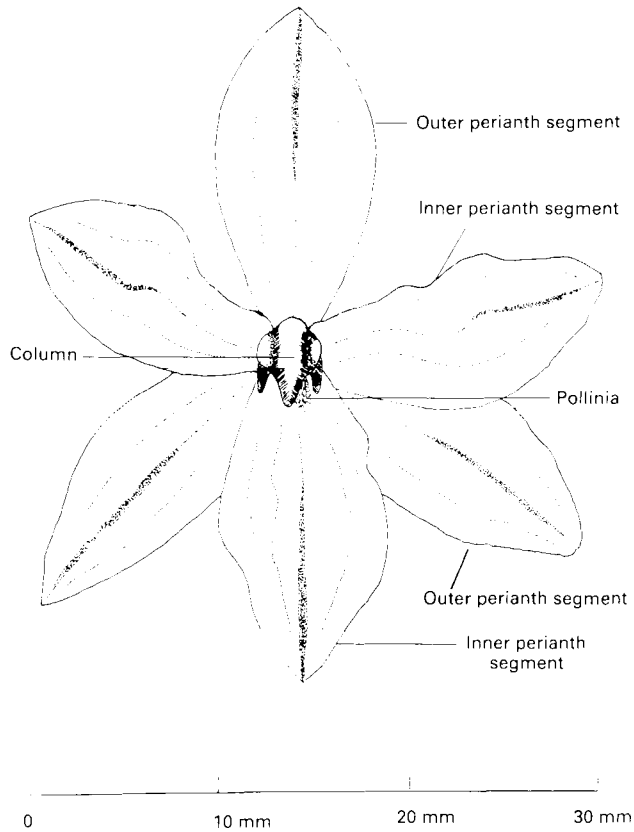

FIGURE 1. Abnormal *Ophrys apifera* from Oxwich Burrows.

morphological variants arising through mutation to persist, and sometimes predominate, in certain areas.

In his paper on peloria and pseudopeloria, Bateman (1985) identified two categories of peloria: type (a) in which the lateral inner perianth segments are replaced by additional well differentiated labella; and type (b) in which the labellum is replaced by a third, undifferentiated, inner perianth segment. Clearly the peloria demonstrated by the Oxwich plants is not of either category, but comes close to that described by Horsman (1990) for *Orchis latifolia* L. Horsman proposed a new category, which he called type (c) peloria, where all the perianth segments are identical. The perianth segments of the Oxwich plants are not identical, and form an inner and outer series of three each. The inner segments are morphologically similar, but have no resemblance to either the labellum or the lateral inner perianth segments of normal *O. apifera*. The Oxwich plants probably merit a subdivision of Horsman's type (c) peloria. The literature describes four abnormal kinds of *O. apifera* which have been given subspecific or varietal status. It would be more consistent to treat these as having equal rank, preferably using varietal names.

Var. **botteronii** Chodat (syn. subsp. *jurana* Ruppert, var. *friburgensis* Freh.). The two lateral petals resemble pink sepals, with finely hairy margins. Labellar speculum bears two confluent yellow areas. First described in Britain in 1984 in Wiltshire (Laurence 1986). Illustrated by Duperrex (1961), Baumann & Künkele (1982), Davies *et al.* (1983) and Lang (1989).

Var. **bicolor** (Naegli) Nelson. The base of the labellum is greenish, lacking any pattern, rest of labellum dark brown. Recorded from Anglesey by Roberts (1985). Illustrated by Baumann & Künkele (1982) and Davies *et al.* (1983).

Var. **flavescens** Rost (syn. var. *chlorantha* (Hegetschw.) Richter, var. *immaculata* Breb.). Sepals white, labellum lacking basal red brown pigmentation, appearing sage green. Widespread. Locally frequent in E. Suffolk and E. Sussex. Illustrated by Lang (1980), Baumann & Künkele (1982) and Davies *et al.* (1983).

Var. **trollii** (Hegetschw.) Reichenbach. Labellum long and pointed, often barred brown and yellow. Long known from Gloucestershire, Dorset and several other localities. Illustrated by Summerhayes (1951), Lang (1980) and Baumann & Künkele (1982).

In addition, a pseudopeloric variant, in which the labellum is replaced by a pink sepaloid segment, was first recorded in E. Sussex in 1924 by C. B. Tahourdin. Illustrated by Tahourdin (1924), Wolley-Dod (1937) and Lang (1980).

None of the above corresponds to the Oxwich plants. However, F. Horsman (pers. comm) informs me that Camus & Camus (1929) recorded a similar variant from mainland Europe.

ACKNOWLEDGMENTS

I am grateful to Ian Denholm and Frank Horsman for assistance in the preparation of this note.

REFERENCES

BATEMAN, R. M. (1985). Peloria and pseudopeloria in British orchids. *Watsonia* **15**: 357–359.
BAUMANN, H. & KÜNKELE, S. (1982). *Die wildwachsenden Orchideen Europas*. Stuttgart.
BAUMANN, H. & KÜNKELE, S. (1986). Die Gattung *Ophrys* L. – eine taxonomische Ubersicht. *Mitt. Bl. Arbeitskr. Heim. Orch. Baden-Wurtt.* **18**: 320–323.
CAMUS, E. G. & CAMUS, A. (1929). *Iconographie des Orchidées d'Europe et du Bassin Méditerranéen* **2**, p. 325. Paris.
DAVIES, P., DAVIES, J. & HUXLEY, A. (1983). *Wild orchids of Britain and Europe*. London.
DUPERREX, A. (1961). *Orchids of Europe*. Blandford.
HORSMAN, F. (1990). Peloria in *Dactylorhiza*. *B.S.B.I. News* **55**: 16–18.
LANG, D. C. (1980). *Orchids of Britain*. Oxford.
LANG, D. C. (1989). *A guide to the wild orchids of Great Britain and Ireland*, 2nd ed. Oxford.
LAURENCE, R. J. (1986). *Ophrys apifera* Hudson subsp. *jurana* Ruppert found in Britain. *Watsonia* **16**: 177–8.
ROBERTS, R. H. (1985). Some unusual orchid variants from Anglesey. *Watsonia* **15**: 275–277.
SUMMERHAYES, V. S. (1951). *Wild orchids of Britain*. London.
TAHOURDIN, C. B. (1924). *Some notes as to British Orchids*. Croydon.
WOLLEY-DOD, A. H. (1937). *Flora of Sussex*. Hastings.

D. C. LANG
20 Ferrers Road, Lewes, Sussex, BN7 1PZ

SALIX × *SEMINIGRICANS* A. & G. CAMUS: A WILLOW HYBRID NEW TO THE BRITISH ISLES

On 19 July 1985, as part of a *Salix* course at Kindrogan Field Centre, Perthshire, a visit was made to the River Tay, near Meikleour. On the west bank of the river, immediately north of Kinclaven Castle, three willow bushes were seen on either side of the bridge that crosses the Tay at this point. Of the two growing north of the bridge one was fully grown, about 9 m tall, with a trunk about 15 cm diam. leaning out over the river; the second was smaller and less mature, and the third, to the south of the bridge, was clearly juvenile, erect, about 2 m tall, and had almost certainly arisen vegetatively

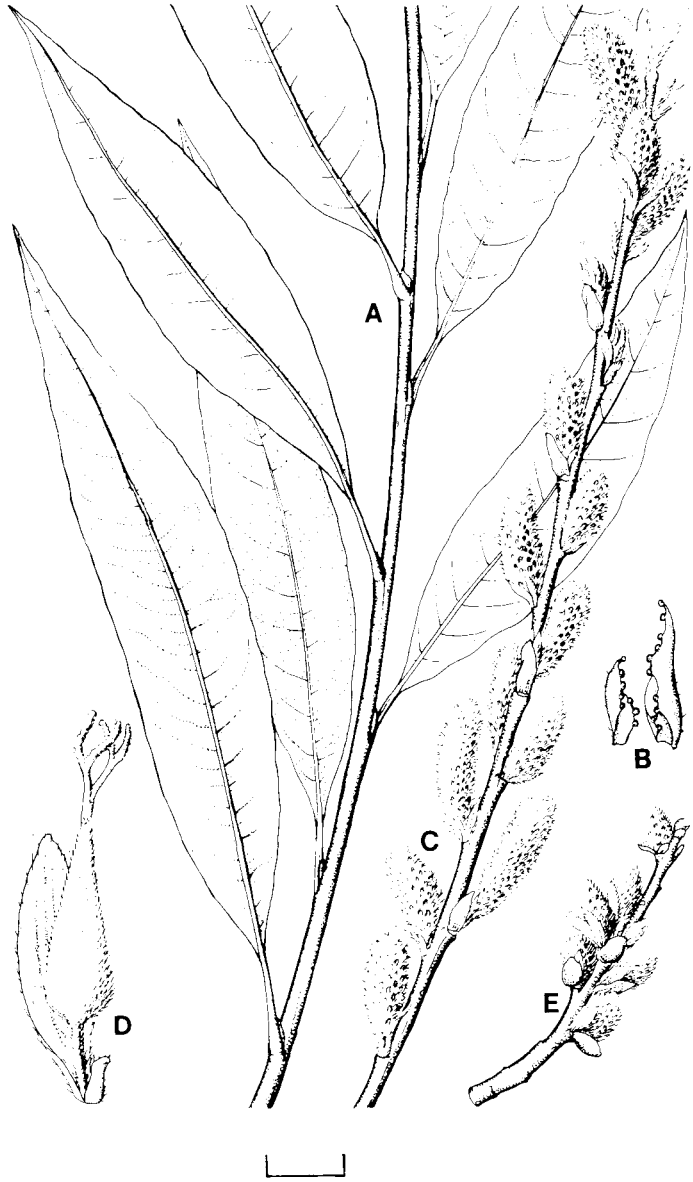

FIGURE 1. *Salix* × *seminigricans* A. & G. Camus
A: leaves; B: stipules; C: catkins; D: ♀ flower; E: tip of flowering shoot.
Scale bar = 1 cm (A, C, E) or 0·6 mm (B, D).

from a broken-off branch carried downstream from the largest bush. The three were morphologically indistinguishable.

At first sight it was clear that the willow was a *viminalis*-hybrid: it had the acuminate leaves characteristic of such hybrids; but the relatively sparse indumentum on the underside of the leaves, the subglabrous, greenish shoots, and the small, poorly developed stipules ruled out the more usual *viminalis*-hybrids, namely *S.* × *smithiana* Willd. (*S. cinerea* L. × *S. viminalis* L.) and *S.* × *sericans*

Tausch ex Kerner (*S. caprea* L. × *S. viminalis* L.), and suggested that it was much more likely to be *S. myrsinifolia* Salisb. × *S. viminalis* L. (*S.* × *seminigricans* A. et G. Camus), a hybrid not previously recorded for the British Isles, and evidently rare on the Continent. *Salix myrsinifolia* was plentiful in the area, and *S. viminalis* was seen on the banks of the R. Isla nearby.

No catkins were available at the time of the visit, and, without these, a final decision on the identity of the willow could not be made. Fortunately Mr Jeremy Heath (of Colchester and Essex Museum) had, at some personal risk, climbed out over the river, and had obtained good specimens from the largest bush, which, on his return to Colchester, he successfully rooted and cultivated, so that, by the spring of 1990, he was able to supply me with excellent flowering material. The catkins confirm my earlier, tentative identification. I am satisfied that the hybrid is *S. myrsinifolia* × *S. viminalis*, and since it may be found elsewhere in Scotland or northern England, a full description and illustration (Fig. 1) may be useful.

Salix × **seminigricans** A. & G. Camus, *Class. Saules d'Europe* **2**: 130 (1905).
S. nigricans Sm. × *S. viminalis* L.; Schmalh. in *Bot. Zeit.* **33**:574 (1875); Trautv., *Increm. Fl. Phaenog. Ross.* **3**:698 (1883); Guerke, *Pl. Europ.* **2**:27 (1897).
S. myrsinifolia Salisb. × *S. viminalis* L.
TYPE: U.S.S.R., near Leningrad, *Schmalhausen* (?**KW**, **LE**, **P**)

Spreading shrub or small tree to about 9 m high; twigs glabrous, rather lustrous olive-brown; buds brown, glabrescent; current year's shoots greenish, subglabrous. Leaves lanceolate, acuminate, 5–15 ×1·3–3 cm, rather glossy mid-green above (blackening slightly when dried), greyish and thinly adpressed-pubescent below, nervation distinctly impressed above, midrib and lateral nerves prominent below, margins indistinctly undulate-crisped, entire or subentire; petiole to 1·5 cm long; thinly pubescent; stipules developed only on vigorous growths, small, acute or acuminate, usually less than 3 mm long, submembranous, thinly pubescent, margins glandular. Female catkins appearing in March before the leaves, rather crowded towards the tips of the branches, sessile or subsessile, erect or spreading, cylindrical, blunt, 2–3 cm long, 0·7–0·8 cm diam.; bracts sericeous, lanceolate, rather inconspicuous, usually less than 1 cm long; flowers crowded; catkin-scales ovate, obtuse or shortly acute, about 2 mm long, 0·8–1 mm wide, fuscous on the upper half, rather densely sericeous; nectary solitary, oblong, about 0·2 mm long, shorter than the pubescent pedicel; ovary narrowly ovoid, tapering to apex, about 2–2·5 mm long, 0·7 mm wide, closely adpressed-sericeous; style distinct, about 0·5 mm long; stigmas cleft almost to the base into 4 filiform arms about 1 mm long. Male flowers not seen.

Scotland: Mid-Perth (v.c. 88), west bank of R. Tay immediately north and south of the bridge at Kinclaven Castle; leaves collected 19 July 1985, *J. J. Heath* & *R. D. Meikle* s.n.; flowers from plants cultivated at Colchester by *J. J. Heath*, comm. 6 March 1990.

Europe: U.S.S.R., Leningrad area.

R. D. MEIKLE
Ranscombe Lodge, Wootton Courtenay, Minehead, Somerset, TA24 8RA

THE TYPIFICATION OF *RANUNCULUS BACHII* WIRTG.

In June 1844, the Prussian botanist Philipp Wirtgen discovered some unusual stands of Batrachian *Ranunculi* in the River Sayn and adjacent mill-races between Sayn and Isenburg, near Koblenz. He provisionally named these plants *Ranunculus bachii* (Wirtgen 1845), subsequently described them as *Batrachium bachii* (Wirtgen 1846a) and, later in the same year, provided the combination *Ranunculus bachii* (Wirtgen 1846b).

Wirtgen's herbarium is at Munster (**MSTR**) and he took his Dr. phil. at Bonn (**BONN**). We have borrowed Wirtgen material of this locality from both of these herbaria. It can be divided into two kinds, one of which has no floating leaves and small flowers, the other a different habit, floating leaves and larger flowers. The former fits Wirtgen's original description and that of Webster (1990) and we select one of the sheets of this kind, "*Ranunculus fluitans β bachii* Wtg. In der Sayn bis Isenburg, lgt. com. Wirtgen" (**MSTR**) as the lectotype of *Batrachium bachii* Wirtgen. It is

morphologically intermediate between *R. fluitans* and *R. trichophyllus*. The other kind seems to be indistinguishable from *R.* × *kelchoensis* S. Webster (1990) (*R. fluitans* × *peltatus*).

There is a possible problem with these hybrids. We do not know what range of morphology would be shown by the hybrid *R. aquatilis* × *fluitans*. Cook (1966, 1975) says that some forms of this hybrid are indistinguishable from, and comprise part of *R.* × *bachii*. On the other hand if they had floating leaves they might be indistinguishable from *R.* × *kelchoensis*. The sensible thing to do is to put all plants into these two taxa, using binomials, until such time as a *R. aquatilis* × *fluitans* can be morphologically recognised.

REFERENCES

Cook, C. D. K. (1966). A monographic study of *Ranunculus* subgenus *Batrachium* (DC.) A. Gray. *Mitt. bot. StSamml., München*. **6**: 57–237.

Cook, C. D. K. (1970). Hybridization in the evolution of *Batrachium*. *Taxon* **19**: 161–166.

Webster, S. D. (1990). Three natural hybrids in *Ranunculus* L. subgenus *Batrachium* (DC.) A. Gray. *Watsonia* **18**: 139–146.

Wirtgen, P. [W.] (1845). Zweiter Nachtrag zur Flora preuss. Rheinlande. *Verh. naturh. Ver. preuss. Rheinl.* **2**: 22–32.

Wirtgen, P. [W.] (1846a). *Batrachium bachii* Wirtg.: eine neue Pflanzenspecies. *Verh. naturh. Ver. preuss. Rheinl.* **3**: 8–10.

Wirtgen, P. [W.] (1846b). Dritter Nachtrag zu dem Prodromus der Flora der preuss. Rheinlande. *Verh. naturh. Ver. preuss. Rheinl.* **3**: 33–45.

P. D. Sell* & S. D. Webster
Botany School, Downing Street, Cambridge, CB2 3EA

THREE NEW GRASS COMBINATIONS

Three names of grasses used in *New Flora of the British Isles* (Stace 1991) have not been validly published before now. They are new combinations necessitated by the adoption of the generic circumscriptions in *Genera Graminum* (Clayton & Renvoize 1986). All three are casuals on tips and waste ground, the first two occasional, the last rare.

1. **Helictotrichon neesii** (Steudel) Stace, **comb. nov.**
Amphibromus neesii Steudel, *Syn. Fl. Glum.* **1**: 328 (1854)

2. **Ceratochloa staminea** (E. Desv.) Stace, **comb. nov.**
Bromus stamineus E. Desv. in C. Gay, *Fl. Chil.* **6**: 440 (1854)
Bromus valdivianus Philippi in *Linnaea* **29**: 101 (1857)

3. **Leptochloa muelleri** (Benth.) Stace, **comb. nov.**
Diplachne muelleri Benth., *Fl. Austral.* **7**: 619 (1878)

REFERENCES

Clayton, W. D. & Renvoize, S. A. (1986). *Genera Graminum*. London.
Stace, C. A. (1991). *New Flora of the British Isles*. London.

C. A. Stace
Department of Botany, University of Leicester, Leicester, LE1 7RH

FESTUCA ARUNDINACEA SCHREB. VAR. *STRICTIOR* (HACK.) K. RICHT.

Hackel (1882) was the author of *F. arundinacea* Schreb. subvar. *strictior* which was raised to a variety by K. Richter. A taxon of the description given by Hackel (1882) can be recognised in the field but is seldom found as an isolated plant and is more often seen within large or small colonies of *F. arundinacea*. This taxon has not been widely accepted and few records exist.

Hackel (1882) described subvar. *strictior* with "leaf blades narrower (3–5 mm broad) and shorter (than *F. arundinacea*), stiff becoming sub-convolute on drying . . . panicle shorter (up to 15 cm long), strict, scarcely nodding . . . spikelets as of *F. arundinacea*". Having examined a considerable number of small specimens of *F. arundinacea*, I concluded that var. *strictior* could be more fully described as follows: height 50–90 cm, panicle length 6–15 cm, upper cauline blade (1·5–) 4–10 cm × 1–3·5 mm, spikelet 8–10 mm, lemma (5·5–) 6–8 mm.

Druce (1931) collected the plant at Budleigh Salterton, S. Devon (v.c. 3) and Townsend (1953) collected it from "a marshy field" near Barbers Bridge station, W. Glouc. (v.c. 34); both collections were determined by Howarth. Kent (1975) recorded subvar. *strictior* from Hounslow Heath, Middlesex (v.c. 21) in the late "forties" in the company of C. E. Hubbard, who at the time treated it as a subvariety of no importance. This taxon was not listed in Hubbard (1954). Webster (1978) returned var. *strictior* to modern recognition with a site on the banks of the R. Spey at Dandaleith, Moray (v.c. 95), 1974, **E** and on newly sown verges at Cluanie Dam in Glen Moriston, Easterness (v.c. 96), 1974, **E**; both of these records were determined by C. E. Hubbard.

In Cambs. (v.c. 29) *F. arundinacea* demonstrates its preference for calcareous clay. With Balsham as a centre, it is seen on the road verges to the south of Woodhall Farm, along the Balsham-Linton road. Large colonies are found at intervals along the B1052 in a north-easterly direction as far as Dullingham and east to Kirtling. The soil of this area is a chalky boulder clay of the Hanslope series over a chalky till. The soil survey of England & Wales (1983) describes it as slowly permeable calcareous clayey soil. Most of the soil samples would be pH 7·5–8·0. It is heavy land and its road verges have been subject to much over-riding of farm machinery and other wheeled traffic, which has compacted the soil to cause impeded drainage and allow for a high level of moisture retention.

F. arundinacea is almost absent from the soils of the Middle Chalk in Cambs. (v.c. 29). In a survey of road verges from the south of Thriplow on the A505, east to Babraham, over The Gog and Magog Hills to the Beech Woods and down to Fulbourn, only three plants of var. *strictior* were seen in isolation, just west of Duxford and two plants near Pampisford Hall.

Plants corresponding to var. *strictior* are found on the boulder clay in Cambridgeshire, in association with the typical variety. They are seldom seen in isolation, as quoted above at Duxford and Pampisford, but as a single culm within a clump or on the open margin of a colony in which it is frequently over-shadowed by the taller culms of typical *F. arundinacea*. The smaller variant is also found near the margin of road verges and a closer look sometimes reveals that the plant has been damaged by traffic running over the verge. Within any colony of *F. arundinacea* of 50–80 flowering stems, there are plants with short, narrow upper cauline blades of 4–10 cm long and short strict panicles, which may have a culm length of over 150 cm. Equally short panicles of 6–15 cm long are found with upper cauline blades of over 40 cm long. In large colonies, tall stem-growth inevitably over shadows weak stem-growth and var. *strictior* becomes stunted. It seems clear that a random selection of short-stemmed plants will not necessarily have short panicles and/or short upper cauline blades. It is considered that Hackel's taxonomic recognition of this variant of *Festuca arundinacea* is inappropriate and that those small plants with short, strict panicles and short upper cauline blades should only be considered as environmentally-induced variants.

ACKNOWLEDGMENT

I thank Dick David for his help in the translation of Hackel's description of subvar. *strictior*.

REFERENCES

DRUCE, G. C. (1931). Plant record. *Rep. botl. Soc. Exch. Club Br. Isl.* **9**: 678.
HACKEL, E. (1882). *Monographia Festucarum Europaearum*, p. 154. Berlin.

HUBBARD, C. E. (1954). *Grasses*, p. 145. Harmondsworth.
KENT, D. H. (1975). *Historical Flora of Middlesex*, p. 566. London.
SOIL SURVEY OF ENGLAND & WALES (1983). Sheet 4, eastern England.
TOWNSEND, C. C. (1953). Plant record. *Watsonia* **2**: 356.
WEBSTER, M.McC. (1978). *Flora of Moray, Nairn and East Inverness-shire*, p. 147. Aberdeen.

P. J. O. TRIST
Glovers, 28 High Street, Balsham, Cambridge, CB1 6DJ

CONTRIBUTIONS TO A CYTOLOGICAL CATALOGUE OF THE BRITISH AND IRISH FLORA. 1

A cytological catalogue of the British and Irish flora is being prepared (funded in part by a grant from the Welch Bequest), which will collate details of all published and unpublished chromosome counts made on indigenous material of native species (Gornall 1989). As only about 62% of the flora have properly documented counts, much original work still needs to be done; this is being conducted at three centres: the Botany Department, Leicester University; the Scottish Crop Research Institute, Invergowrie; and Trinity College, Dublin. The present paper is the first in a new series which will report the results of our studies as they progress. The chromosome counts of 61 species and their provenances are presented here. Figures in parentheses after the locality details indicate the number of plants counted. All counts were made from squashes of root-tips; supernumerary chromosomes are designated by the suffix 'S'. Voucher specimens have been placed in **LTR**.

Ammophila arenaria (L.) Link, 2n = 28: S. Lancs., v.c. 59, Ainsdale, 34/2.1 (3).
Anthriscus sylvestris (L.) Hoffm., 2n = 16: W. Cornwall, v.c. 1, Buryas Bridge, 10/44.29 (1).
Arctium minus Bernh., 2n = 36: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Atropa bella-donna L., 2n = 72: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Blackstonia perfoliata (L.) Hudson, 2n = 40: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Callitriche brutia Petagna, 2n = 28: Caerns., v.c. 49, W. of Rhydlios, Methlem Farm, 23/174.301 (1).
C. platycarpa Kutz., 2n = 20: Caerns., v.c. 49, N. of Llangwnnadl, Traeth Penllech, 23/20.34 (3).
Campanula trachelium L., 2n = 34: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Carduus acanthoides L., 2n = 16: Derbys., v.c. 57, Milldale, 43/14.55 (1).
Centaurea nigra L., 2n = 44: W. Norfolk, v.c. 28, Fouldon Common, 52/761.997 (3).
Chamaemelum nobile (L.) All., 2n = 18: Caerns., v.c. 49, SW. of Abersoch, S. of Mynydd Cilan, 23/292.240 (1).
Clematis vitalba L., 2n = 16: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (1).
Cynodon dactylon (L.) Pers., 2n = 36: S. Somerset, v.c. 5, Warren Point, Minehead, 21/986.463 (1); N. Somerset, v.c. 6, Weston-super-Mare, 31/317.603 (1); S. Essex, v.c. 18, Southend, Shoebury-ness, 51/448.852 (1). (No vouchers.)
Digitalis purpurea L., 2n = 56: Caerns., v.c. 49, Llaniestyn, near Penbodlas, 23/281.337 (2).
Erodium cicutarium (L.) L'Herit. subsp. *cicutarium*, 2n = 40: Derbys., v.c. 57, Dovedale, 43/14.52 (1).
Euonymus europaeus L., 2n = 32: Surrey, v.c. 17, Old Coulsdon, hillside above Old Lodge Lane, 51/31.59 (1); Caerns., v.c. 49, near Aberdaron, by the Afon Saint, 23/166.265 (1).
Filipendula ulmaria (L.) Maxim., 2n = 16: Derbys., v.c. 57, Dovedale, 43/14.51 (1).
Fragaria vesca L., 2n = 14: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (3).
Frankenia laevis L., 2n = 30: W. Sussex, v.c. 13, East Wittering, 40/80.97 (1).

Galium aparine L., 2n = 66: Caerns., v.c. 49, E. of Sarn, 23/24.32 (1).
G. mollugo L., 2n = 44: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Geum urbanum L., 2n = 42: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (1).
Hypericum hirsutum L., 2n = 18: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (2); Derbys., v.c. 57, Dovedale, 43/14.51 (1).
H. humifusum L., 2n = 16: W. Cornwall, v.c. 1, Goonhilly 10/73.21 (1).
Inula conyza DC., 2n = 32: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Iris foetidissima L., 2n = 40: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (1).
Lepidium heterophyllum Bentham, 2n = 16: Caerns., v.c. 49, near Aberdaron, overlooking Afon Saint, 23/16.26 (1).
Leymus arenarius (L.) Hochst., 2n = 56 + 3S: S. Lancs., v.c. 59, Ainsdale, 34/2.1 (3).
Lycopus europaeus L., 2n = 22: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (3).
Lysimachia nemorum L., 2n = 18: Caerns., v.c. 49, Nanhoron valley, S. of Inkermann Bridge, 23/28.32 (3).
Medicago arabica (L.) Hudson, 2n = 16: Caerns., v.c. 49, Aberdaron, 23/172.264 (1).
Mercurialis perennis L., 2n = 64: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (1); Derbys., v.c. 57, Dovedale, 43/14.51 (1).
Montia perfoliata (Willd.) Howell, 2n = 36: Leics., v.c. 55, Leicester, university campus, 43/59.04 (1).
Myosotis sylvatica Hoffm., 2n = 18: Caerns., v.c. 49, Llaniestyn, near Penbodlas, 23/281.337 (1).
Ononis spinosa L., 2n = 30: W. Norfolk, v.c. 28, Foulden Common, 52/761.997 (3).
Origanum vulgare L., 2n = 30: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (2); Derbys., v.c. 57, Dovedale, 43/14.51 (1).
Pastinaca sativa L., 2n = 22: N. Hants., v.c. 12, near Petersfield, W. of Shoulder of Mutton, above Steep, 41/73.26 (2).
Pilularia globulifera L., 2n = 26: Caerns., v.c. 49, S. of Abersoch, Mynydd Cilan, 23/291.241 (1).
Plantago coronopus L., 2n = 10: W. Cornwall, v.c. 1, near St Just, 10/39.31 (1).
P. lanceolata L., 2n = 12: Derbys., v.c. 57, Dovedale, 43/14.52 (3).
P. major L. subsp. *major*, 2n = 12: Derbys., v.c. 57, Milldale, 43/14.54 (3).
P. major subsp. *intermedia* (DC.) Arcangeli, 2n = 12: Leics., v.c. 55, Cropston Reservoir, 43/54.10 (3).
Potentilla sterilis (L.) Garcke, 2n = 28: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (1); Derbys., v.c. 57, Dovedale, 43/14.51 (1).
Primula veris L., 2n = 22: Derbys., v.c. 57, Milldale, 43/14.55 (3).
P. vulgaris Huds., 2n = 22: Caerns., v.c. 49, Llanbedrog, W. of Penarwel, 23/328.324 (1).
Ranunculus repens L., 2n = 32: Caerns., v.c. 49, Llaniestyn, near Penbodlas, Llys Hyfryd, 23/28.33 (1).
Rumex obtusifolius L., 2n = 40: Derbys., v.c. 57, Milldale, 43/14.54 (1).
Sanguisorba minor Scop., 2n = 28: Derbys., v.c. 57, Dovedale, 43/14.52 (1).
Sanguisorba officinalis L., 2n = 56: Leics., v.c. 55, Broughton Astley, 42/53.94 (3).
Saxifraga hypnoides L., 2n = 52: Derbys., v.c. 57, Milldale, 43/14.55 (3).
Sherardia arvensis L., 2n = 22: Derbys., v.c. 57, Dovedale, 43/14.52 (1).
Sibthorpia europaea L., 2n = 18: S. Devon, v.c. 3, Dartmoor, north of Holne, Newbridge, 20/712.709 (1).
Silaum silaus (L.) Schinz & Thell., 2n = 22 + 0–1S: W. Norfolk, v.c. 28, Foulden Common, 52/761.997 (3).
Teucrium scorodonia L., 2n = 34: Derbys., v.c. 57, Dovedale, 43/14.51 (1).
Tragopogon porrifolius L., 2n = 12: Co. Durham, v.c. 66, Crimdon to Blackhall, 45/47.38 (1).
Umbilicus rupestris (Salisb.) Dandy, 2n = 48: Caerns., v.c. 49, Llaniestyn, near Penbodlas, 23/28.33 (1).
Urtica dioica L., 2n = 52: Derbys., v.c. 57, Dovedale, 43/14.52 (1).
Verbascum thapsus L., 2n = 36: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (1).
Veronica beccabunga L., 2n = 18: Derbys., v.c. 57, Milldale, River Dove, 43/14.55 (3).

Viburnum lantana L., 2n = 18: Surrey, v.c. 17, Old Coulsdon, hillside above Old Lodge Lane, 51/31.59 (1).

Viola reichenbachiana Jord. ex Boreau, 2n = 20: Dorset, v.c. 9, Wareham, Washer's Pit, 30/86.94 (1).

REFERENCE

GORNALL, R. J. (1989). A proposed cytological catalogue of the British and Irish flora. *B.S.B.I. News* **51**: 34.

J. E. WENTWORTH, J. P. BAILEY & R. J. GORNALL
Botany Department, The University, Leicester, LE1 7RH