The status of Coral-necklace *Illecebrum verticillatum* L. (Caryophyllaceae) in Great Britain

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ABSTRACT

The native range of *Illecebrum verticillatum* in England is re-considered in the light of newly available historical records and nineteenth and twentieth century forestry and recreational activities. It is concluded that is probably a nineteenth century arrival outside of Cornwall, but that it is now a benign and intimate part of the flora that conservationists want to preserve. Milder winters seem to aiding the spread and survival of new populations. Nonetheless if only the Cornish populations were to be taken into account, then it would have a much higher Threat Status and thus attract more funding.

KEYWORDS Native and alien ranges; conservation criteria; forestry and recreation; climate.

DESCRIPTION, HABITATS, ECOLOGY AND PHYTOGEOGRAPHY

Illecebrum verticillatum is a small glabrous annual with reddish stems which elongates to form a many-stranded plant over summer. It is often scarcely visible before late July, flowers late in the season and is usually killed by frosts. However, well-grown plants, presumably belonging to the previous year, have been noticed in West Cornwall and the New Forest as late as January; C. Chatters (pers. comm.) on a visit in late January 2008, noticed much material including plants in active growth in a New Forest pond kept open by mechanical cutting, arson and mountain bikes. He found. The submerged material, in about 20 cm of water, had infrequent green growing points from the apical tip of the last season's 'branches'. The terrestrial material, on a slight slope above the pond's current water-level, in a zone that might be inundated in extreme circumstances, was much greener with well developed leaves and fresh growth, with the base of stems and the central root quite woody. The plants had weathered the hard frosts of early winter with the terrestrial plants in stronger growth than those buffered from the hardest frosts by being submerged. None had the appearance of recently germinated plants over-wintering to bloom the following year. Another West Cornwall site visited by DAP in mid-February 2008, revealed good growth with green, not red, stalks.

It grows in or by pools or on seasonally wet sandy, or gravelly, tracks (including rides in forestry plantations) and heathy lawns on acid soils. It also occurs on railway clinker, possibly spreading from nearby forestry rides, and as a casual elsewhere. It spreads by seed though it has been known to root from stem fragments. In West Cornwall associates in 2005 included *Hydrocotyle vulgaris*, *Hypericum elodes*, *Isolepis setacea*, *Juncus bulbosus*, *Lythrum portula*, *Myosotis secunda*, *Potamogeton polygonifolius*, and *Ranunculus flammula*. On Bodmin Moor associates in 2007 included *Hypericum elodes*, *Juncus articulatus*, *J. bulbosus*, *Lythrum portula*, *Myosotis secunda*, *Potamogeton polygonifolius*, and *Ranunculus flammula*. Murphy (1994) gives track associates as *Cicendia filiformis*, *Gnaphalium uliginosum* and *Radiola linoides* whilst for the New Forest pools she lists *Galium constrictum*, *Hydrocotyle vulgaris* and *Littorella uniflora*, with rarer *Anagallis minima* and *Cicendia filiformis*.

Illecebrum verticillatum is a suboceanic southern-temperate species which appears to be widespread in N.W. Europe, from Poland to southern Spain, with very isolated scattered outliers in Italy, Greece and the Azores (Jalas & Suominen 1976). Hulten & Fries (1986) show many additional outliers, together with a large part of N.W. Africa. Little is known as to its current status in Europe; the Atlas for West Germany (Haupler & Schonfelder 1988) shows it to have declined severely in that area.

The first record in the British Isles was made by John Ray on a trip to Cornwall in 1662,

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possibly near to St Columb near Newquay; there have been many other records from that county during the next two centuries. It was not until 1846 that it was found elsewhere (in Kent), with later records from Berkshire (1891), Hampshire (c. 1920) and Dorset (1981).

In the British Isles most recent floras and atlases have treated it as a native plant in Cornwall, Hants and Berkshire and as an alien elsewhere, though with no rationale for those decisions.

HISTORY IN BRITAIN

CORNWALL (V.CC 1 & 2)

Rose Murphy (pers. comm.) writes that "old and recent records of *lllecebrum verticillatum* appear to be concentrated on the granite areas of Cornwall, or on the metamorphic aureoles that surround the granite where most of the mining and tin-streaming (and disturbance) took place".

Davey (1909) gives about 40 sites, dating back to the Ray's first record of 1662, describing it as widely distributed but rather rare; Thurston & Vigurs (1922) add another six sites. There are currently records from 63 tetrads, past and present (Colin French pers. comm.) Not until the flora of Margetts & David (1981) is there any mention of a decline, where the caption merely states that 'this very local plant has declined in the last fifty years for reasons that are not easy to find, as there are still plenty of suitable habitats'. Whatever their reservations, it is clear that lack of management, with no grazing and no disturbance, led to a massive decline in both *Illecebrum verticillatum* and in its associated rare species such as *Anagallis minima* and *Radiola linoides*. Stewart *et al*. (1994) gave recent records from seven 10 km squares in Cornwall. The latest Cornish Flora, French *et al*. (1999) correctly attributed the serious decline to loss or change of habitat, but still showed recent records from five 10 km squares.

The situation in 2008 is that is known in West Cornwall (v.c. 1) from three small sites in one 10 km square (perhaps around twenty plants in all) and in East Cornwall (v.c. 2) as less than five plants in one site and good populations on Bodmin Moor – a total of three 10 km squares and five tetrads for the county. Further details of the decline there will be covered in a forthcoming article (Pearman, in press).

OTHER COUNTIES

SOUTH HAMPSHIRE (V.C. 11)

Illecebrum verticillatum was first recorded in v.c. 11 at Titchfield Haven in 1920 (Rayner 1929), across the Solent Estuary from its current stronghold in the New Forest. There are no further details of this record. Rayner gives the first record from the New Forest 'young spruce plantation, Wilverley Inclosure, in great abundance, 1925' and describes its gradual disappearance there over the next three years as it was displaced by native grasses. He relates the experience of a Mr Hall, who grew it in cultivation, and noted its ability to very quickly cover cleared ground, but that it was unable to maintain its hold in competition with other plants. Rayner also reports that a specimen, labelled as from this locality (presumably he meant Wilverley) was brought anonymously to the Southampton Wild Flower Exhibition in 1920.

Brewis *et al*. (1996) noted that it had steadily spread over some 50 years, with records there from some 30 tetrads. There was no comment in this work on its likely origin, other than a comment on the original Wilverley record, where it was noted as 'perhaps introduced with imported conifers'.

It is not clear if the increase in records is the result of genuine spread or due to better recording. Factors leading to a rapid spread might include heavy grazing pressures (though precise figures are hard to interpret, cattle numbers are higher than in the past), recreation (lots of riders), together with the disturbances associated with gravel extraction; there has also been much forestry work. The newly-established Forestry Commission took over responsibility for the management of the New Forest in 1923. Much conversion of broad-leaved woodland to conifers took place from that date, though some had already occurred following the New Forest Deer Removal Act of 1851 (Tubbs 1986). Work on forestry is still ongoing, including removal of trees planted as late as the 1970s. All these activities could have physically spread the plant from site to site and created suitable, often seasonally flooded, open ground. Warmer winters and different rainfall patterns may also have aided its spread. Clive Chatters (conservation officer for the Hampshire Wildlife Trust and the new chairman of the New Forest National Park) and the current V.C. Recorder, Martin Rand (pers.

comm.) have pointed out that many of the older and the currently known sites for *Illecebrum* are at well-known botanising locations. It is therefore unlikely that it was overlooked although under-recording in the past certainly accounts for the difficulty in tracking the history of its spread and the dynamics of individual populations. Furthermore, they feel it is still spreading, though not just within the core of the Forest itself. Rand adds that it behaves as a coloniser and he cannot think of an instance where it occurs in a well documented and localised site that has not been recently disturbed. He also drew attention to a comment on a herbarium specimen in **BM**, collected at Shave Green Enclosure, Cadnam, 1930, Mrs E. Rothwell, "so abundant that a cartload was taken away and destroyed".

Illecebrum verticillatum is so often associated with other native flora characteristic of these temporary, disturbed sites that it would be difficult for a stranger to the New Forest to judge that it was other than native there. It grows around ponds with a suite of plants including *Pulicaria vulgaris* (first recorded 1835), *Mentha pulegium* (1839), *Galium constrictum* (1924), *Ludwigia palustris* (1645), *Gnaphalium uliginosum*, and *Lythrum portula* (Tubbs 1986). Note that these dates are for the first records for the whole of Hampshire, rather than from the New Forest – all, with the exception of *Galium constrictum*, were first recorded from v.c. 12, North Hampshire. It seems that botanical exploration for the New Forest was quite late compared to many parts of Britian (see Rand (2005) for pertinent comments on *Gladiolus illyricus* – another late discovery). There are also many more records and sites known for *Galium constrictum* and *Ludwigia palustris* over the last 40 years, though Chatters (1999) suggests that this may be due to greater recording effort starting in the 1950s and 1960s rather than any general increase in the numbers of sites or populations.

Galium constrictum, though it is a critical plant, was also not discovered in Hampshire until the 1920s when it was recorded (as *G. debile*) from Lyndhurst and Hatchet Pond (Druce 1924). There was a similar increase in records over the next half-century. Druce makes rather a meal of its native status, concluding 'the European distribution is not antagonistic to *debile* being a native of the Channel Isles and south-western England.' The map in Meusel & Jäger (1992) only tenuously supports this view, showing a core distribution around the Mediterranean with a narrow extension north through France. In Britain it is almost confined to the New Forest. There was a relatively short-lived occurrence in Devon, at a site subsequently lost to ball-clay extraction and two unusual records from South Wiltshire (v.c. 8), where it was recorded in 1984 in water-meadows at North Charlton (SU12), and with imported scalpings lining a new pond at the Shire Horse Centre, Teffont (ST93) – this latter site was wrongly mapped as native in Preston *et al*. (2002).

Elsewhere in South Hampshire there are records from the Avon Valley at Somerley (SU10) (1980s), and Southleigh Forest (SU70), where it was recorded in 1957 and destroyed in 1982. Recently it has been found at Ringwood Forest, west of the R. Avon, on the borders of Hampshire and Dorset, found by Neil Sanderson in 2006.

WEST KENT (V.C. 16)

All Kent records come from the area now known as Bedgebury Forest. It is the site of the National Pinetum, developed on an area of acid soils over gravels and clay which is surrounded by a larger forested area.

Bedgebury was owned by Viscount Lord Beresford, who was a General (later Field Marshal) under the Duke of Wellington in the Spanish Peninsula wars. He bought the estate in 1836, and planted many trees in the earlier years of his ownership. The main estate was purchased from his heirs by the Crown in 1919 for forestry purposes and was developed jointly by the Forestry Commission and the Royal Botanic Gardens, Kew from 1923 until 1965, when the Pinetum reverted solely to the Forestry Commission. The first trees for the Pinetum were raised at Kew in 1921.

There is an mysterious record in the *Flora of Kent* (Hanbury & Marshall 1899), referring to herbarium specimens that were found by a Mr Duthie (presumably Mr J. F. Duthie, who was born in Kent, botanising there until the 1870s, but then spent 30 years in India and Ceylon before returning to Kew in 1903) at Edinburgh University (now at **E**) labelled 'boggy places four miles SW from Dover'. He noted that there was no likely station in the Dover neighbourhood. Hanbury & Marshall wondered whether there is a village of that name in the south-western counties. But Druce (1920) includes a record from near Doves, Kent (indeed, his correspondent pointed out that her site was about four miles away), and on the

current OS map there is a Doves Farm at TQ7834, four miles east of the Bedgebury site.

The Edinburgh specimen was examined by DAP in October 2007. There are two sheets, both from the Kent site: one from the herbarium of W. G. McIvor, collected by him in 1846, and another from the herbarium of a Mr Murchison, though this second sheet lacks a date and source. McIvor's specimen has been annotated by David McClintock as referring to Doves rather than Dover.

Druce's 1920 record seems to have become well-known, as Miss Vachell and her friends visited Sophia Wood, near Hawkhurst, in October 1923 (Rich & Forty 2005). George Hutchinson located Vachell's herbarium specimen at Cardiff Museum (**NMW)**, and plausibly suggested that Sophia Wood was the estate name for what is now known as Frith Wood (TQ7332).

In 1944 Francis Rose reported it from rides in Bedgebury Forest (Anon 1946), where it still occurs, at c. TQ7232. There are other specimens at **NMW** from the same area collected by J. E. Lousley (1944) and R.A. Boniface (1947). It is very likely that all of these records relate to the same site, which extends the history of the plant in the Bedgebury area back to 1846.

BERKSHIRE (V.C. 22)

First discovered in the county by A. W. S. Fisher, a scholar at Winchester College, in 1891 (Druce 1891) and described by Druce (1897) as 'found by a pool; it grows on the damp sandy margin with *Hydrocotyle*, *Ranunculus*, *Millegrana* (*Radiola linoides*), *Drosera*, *Veronica scutellata*, *Juncus bulbosus* and others. No other introduced vegetation is near, except that it is in a district in which Pines and Rhododendrons are planted… Subsequently I found it in considerable abundance, and it appeared as if the *Illecebrum* had been covered with sand brought from the neighbourhood in order to raise the road…'. Druce did not give details of the location, but it was at the western end of Nine Mile Ride near Wellington College (SU86) (Crawley 2005). Though it was last seen there in 1956, it has been found in at least seven nearby sites, in a strip about 8 km in length from west to east. It still persists at Heath Lake (SU8265), and possibly on private land that is inaccessible nearby (Crawley 2005).

Wellington College was opened as a monument to the great Duke in 1859, on a site described at the time as 'a wild and cheerless spot on a bleak, inhospitable-looking moor' (Wellington College website). It lies about five miles to the east of the Stratfield Saye, the house presented to the Duke of Wellington by the nation in 1817.

The Kent and Berkshire sites are both on estates in which forestry plantings were started in the 19th century by military aristocrats. The possibility that they introduced *Illecebrum* from a common source needs investigation.

DORSET (V.C. 9)

The first definite, and for many years the only, record was from the Royal Army Ordnance Corps base at West Moors (SU00), where it was found on the edges of a pool in 1981 and later spread on the cinder base of nearby disused railway sidings. In 2002 Jonathan Spencer, Senior Ecologist for England with the Forestry Commission, reported that he had seen it, some years before, in the rides of a Commission nursery just to the north. This was probably the origin of the plants at West Moors Army site. It still survives in small quantity there. Odd plants have also been found on Army land at Barnsfield Heath (SU10) (political Dorset, but actually in v.c. 11) and at Woolbridge, on army training ranges (SY88).

There is an intriguing earlier record, from the beach at Ferrybridge, Weymouth, in 1792, from a recorder, William Sole, who apparently knew the plant from Cornwall (Barrett 1912), which is assumed to be only a casual (see the records from Braunton and Anglesey, below).

NORTH HANTS (V.C. 12)

Plants were first recorded in 2005, growing in profusion along some of the wet sandy tracks used for military training near Aldershot (SU82) (Mundell 2006). Since then there have been records from at least six sites within five 10 km squares, all within the same type of habitat and use.

OTHER SITES

It is likely that other British records are casual occurrences, though there are a few of interest.

NORTH DEVON (V.C. 4)

There is a specimen in **BM** collected at Braunton Burrows, 1862.

ANGLESEY (V.C. 52)

There is a specimen in **BM** annotated "rocks by the sea, Anglesea", 1921.

SOUTH NORTHUMBERLAND (V.C. 67)

J. P. M. Brenan (Anon 1947) reported records from a nursery near Falstone, noting that it was

suggested that the *Illecebrum* was introduced with bundles of trees obtained from various nurseries. He reports that it was said to be plentiful in certain tree nurseries in the New Forest.

MID LOTHIAN (V.C. 83)

Another specimen in the herbarium at Edinburgh **(E),** labelled 'Dickson's garden in Edinburgh', 19 August, 1796.

OUTER HEBRIDES (V.C. 100)

Specimens in **E** from the Isle of Barra collected by J. W. Heslop Harrison and his colleague W. A. Clark. Details are given by Clark in a cover letter to the director of the Royal Botanic Garden in Edinburgh (dated 19 July 1939) 'thinly scattered around the margin of a loch near Borve'.). He also enclosed a specimen of *Juncus capitatus*, gathered the same day, noting that this latter was only found in one spot. Pankhurst & Mullin (1991) remarked that the *Illecebrum* record required confirmation and it was widely dismissed, along with the *Juncus*, as another Heslop Harrison fraud. However, there is an earlier record from Eriksay (Goodrich-Freer 1902), and Whittington & Edwards (2000) report the finding of subfossil pollen of *Illecebrum* there.

STATUS AND CONCLUSIONS

There is little reason to doubt the nativeness of the records from Cornwall. It has been known continuously for nearly 350 years and, whilst it is almost totally dependant on heavy stock-grazing and disturbance by animals or humans, this is the case for many other annuals of open habitats.

As far as the rest of England is concerned there would be little doubt of its nativeness from a phytogeographical view if we did not know its recent history here. On the criteria used to judge other potential neophytes (see Pearman 2007) the situation would be evenly poised, with spatial coherence, trends in frequency and to some extent first recorded date everywhere other than Cornwall, being balanced by occurrence in semi-natural habitats, persistence and European range. On balance it is unlikely that it was overlooked for nearly 200 years after its discovery in Cornwall in the well-botanised south-east of England and it was probably introduced with various forestry operations there.

In the New Forest the evidence is more equivocal; it is an intimate part of the flora of the wet lawns and pool edges and associated with a suite of native species and is a valued part of a community that conservationists wish to preserve (*vide* Pearman 2007). But it is still increasing its range (there has been a veritable surge in records recently); the *Illecebrum* population appears to have fluctuated with changing stocking practices, leisure pursuits, the amount of tree-planting and gravel extraction. The source of trees planted in the early and mid-nineteenth century in Kent and Berkshire, and that of those planted in the New Forest in the twentieth century is unknown. The reasons for the delayed spread from the Forest need investigating; it is possible that the increase there coincided with the collapse of grazing elsewhere in the south of England, which thus limited the opportunities to spread. Furthermore, as *Illecebrum* is frost-sensitive, recent warmer winters may have helped it spread into areas where it was previously checked by hard frosts.

In the latest Red List (Cheffings & Farrell 2005) *Illecebrum* is categorised as Vulnerable. The heavy losses in Cornwall have, to some extent, been offset by consolidation and new sites in central-southern England. If those latter sites were not treated as native, then it would probably be in the most threatened category, Critically Endangered. It is now on the new BAP list which should stimulate considerable conservation effort in Cornwall, where currently there is none.

ACKNOWLEDGMENTS

I would like to sincerely thank Andy Byfield, Clive Chatters and Martin Rand for really helpful comments on a draft and particularly for details of the New Forest populations; Tony Mundell, for records and information from North Hampshire and for historical background on J. F. Duthie; George Hutchinson and Douglas McKean for information from and access to herbaria at Cardiff and Edinburgh, and Chris Preston and Kevin Walker for other assistance and comments.

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(*Accepted May 2008*)