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## Additions and amendments to the list of British smut fungi

B. M. SPOONER\*, N. W. LEGON

Mycology Section, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE, U.K.

### ABSTRACT

#### Keywords:

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Investigation of material of British smut fungi held in the national collections at Kew (k) undertaken during preparation of the new checklist of British and Irish Basidiomycota (Legon et al. 2005) identified several species not hitherto known from the British Isles. These include taxa not previously recognised due to earlier, broader species concepts, as well as others based on earlier misidentifications or discovered during examination of herbarium material of their host plants. These taxa are fully reported here. In addition, amendments to nomenclature and taxonomy of other British species which have occurred since the monography by Mordue & Ainsworth (1984) are summarised.

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### 1. Introduction

The first monographic treatment of the British smut fungi (Ustilaginomycetes) was published by Plowright (1889) and included just 51 species. Enormous progress since then with regard both to taxonomic concepts and to study of the British species has resulted in extensive amendments and additions to the list. Half a century after Plowright's monograph, the first comprehensive modern checklist (Sampson 1940) was published, which included 70 species and provided a sound basis for a thorough revision of collections of smut fungi held in British herbaria. This culminated just ten years later in a monographic treatment of the British smuts by Ainsworth & Sampson (1950) which provided full descriptions of the taxa together with illustrations of main characters, a key to genera, and full discussion of their biology and genetics. 74 species were included, plus some subspecific taxa and excluded names. This standard work was not superseded until 1984 when a comprehensive revision by Mordue & Ainsworth (1984) added a further 25 species, incorporated changes to the taxonomy and nomenclature and supplied keys for the identification of species. The succeeding 20 years have seen the advent of molecular techniques, which has led to further important developments in the understanding of smut

taxonomy, to the extent that some taxa have been linked more closely with the rusts (Urediniomycetes). Furthermore, extensive revisions of some genera, e.g. *Cintractia* (Piepenbring 2000), have been undertaken, and monographic revisions of European taxa published by Vánky (1994) and by Zogg (1985).

During preparation of the new *Checklist of the British and Irish Basidiomycota* (Legon et al. 2005) investigation of the British smut fungi, mostly based on material held in the national collections at Kew (K), identified several species previously unreported from the British Isles. These can be considered in two categories, viz. taxa not hitherto collected in Britain, and taxa not previously recognised amongst known collections due to earlier, broader species concepts. In addition, amendments to the nomenclature and taxonomic position of some known British species have been required and, although many of these changes and amendments have been largely incorporated into the *Checklist*, they are fully reported here with New British Records (NBRs) so indicated. It is notable that many of these species are yet known from only one or two collections and for many, in fact, there is no recent material. Two further species, *Ustilago corcontica* (Bubák) Liro and *U. scrobiculata* Liro, both on *Calamagrostis canescens*, are also discussed and reported as new to Britain.

\* Corresponding author.

E-mail address: [b.spooner@kew.org](mailto:b.spooner@kew.org)

Other additions to the British smuts since Mordue & Ainsworth (1984) have been published by Pegler *et al.* (1999), Smeathers (1998), and Spooner (1985, 2000, 2003) so that the total British species (including Microbotryales) now stands at 138 (excluding aliens).

In the following list, nomenclature, unless otherwise indicated, follows Vánky (1994) and higher taxonomy follows Bauer *et al.* (1997). Host plants cited are for British collections; any additional hosts recorded in Europe are given in the notes. Collection numbers prefixed K(M) are in the Kew Mycological herbarium, those prefixed IMI are in CABI Bioscience at Egham.

#### USTILAGINOMYCETES

##### DOASSANSIALES

*Tracya hydrocharidis* Lagerh., Bot. Not. 1902: 175 (1902) NBR 217

In leaves of *Hydrocharis morsus-ranae*.

England: Surrey, nr. Egham, Runnymede, 17 July 1938, S. Rawlings (ex. herb. RBG Kew), K(M)108608; same locality, Langham's Pond, 13 July 2005, on mud at edge of a dried out pond, N.W. Legon, K(M)130166.

Northern Ireland: Fermanagh, Crom, Sand Lough, 17 Jul. 1948, in a drainage channel (ex. herb. RBG Kew), R.D. Meikle.

Described from Sweden and known also from Germany and Iran (Vánky, 1994). Sori occur in pale spots on leaves and may be rather inconspicuous, comprising pale brown spore balls up to c. 260 µm diam., gregarious or scattered in the host tissue. Spore balls comprise an outer layer of prismatic, radially arranged spores and a central network of loosely woven, pale brown, septate hyphae. Discovered as British from examination of herbarium material of the host in K, and since found again in Surrey at the same locality. All collections are extremely sparse, consisting of a single leaf, with solitary, minute sori.

The type of the genus, *Tracya lemnae* (Setchell) H. & P. Sydow, in leaves of *Lemna polyrhiza*, occurs elsewhere in Europe but has not yet been found in Britain.

##### ENTYLOMATALES

*Entyloma irregulare* Johanson, Öfvers. Kongl. Svensk. Vetensk.-Akad. Förh. 41: 159 (1885) NBR 218

*Entylomella crastophilum* Cif. (anam.), *Omagiui lui* T. Săvulescu: 176 (1959).

In leaves of *Poa annua*.

A single British record from Gloucestershire (Wotton-under-Edge, 25 Aug. 1959, R.W.G. Dennis, K(M)108572), consisting only of the anamorph. Distinguished from *Entyloma dactylidis*, which may occur rarely on *Poa* spp (Vánky, 1994) though not yet recorded on this host genus in Britain, by the presence of an anamorph and by the closely agglutinated, irregular spores. Present in Europe, Asia and North America *vide* Vánky (1994).

##### TILLETIALES

*Tilletia anthoxanthi* Blytt, Forh. Vidensk.-Selsk. Kristiania 4: 31 (1896) NBR 219

In ovaries of *Anthoxanthum odoratum*.

Widespread in Europe, and found also in North America and New Zealand (Vánky, 1994), but in Britain known hitherto from only a single old collection (Scotland, Ayrshire, West

Kilbride, 18 July 1921, D.A. Boyd, K(M) 107494). The only *Tilletia* species on this host genus.

##### UROCYSTALES

*Urocystis agropyri-campestris* (Massenot) H. Zogg, Cryptog. Helv. 16: 112 (1986) NBR 220

In leaves of *Agropyron pungens*.

England: Norfolk, Brancaster Staithe, 4 July 1937, E.A. Ellis 2481, K(M) 132932; Brancaster, 8 July 1951, E.A. Ellis, K(M) 132931; Suffolk, Walberswick, 2 June 1977, M.B. Ellis, K(M) 106294.

Not previously distinguished in Britain from *U. agropyri*. Known only from Norfolk and Suffolk. Elsewhere little known but recorded from Europe and also from China (Guo & Zhang, 2005).

*Urocystis agrostidis* (Lavrov) Zundel, *Ustilaginales of the World*: 307 (1953) NBR 221

In leaves and culms of *Agrostis* spp.

England: Surrey, Richmond Park, on *Agrostis tenuis*, 1 July 1951, R.W.G. Dennis, K(M)132813; Devon, Newton Abbot, Seale Hayne College, on *A. stolonifera*, 1963, K.C. Vlar, K(M) 106295.

Previously not distinguished from *U. agropyri*, differing in somewhat larger spores and spore balls. Widely distributed in Europe, Asia and the Americas (Vánky, 1994).

*Urocystis alopecuri* A.B. Frank, *Die Krankheiten der Pflanzen*. Pilze: 440 (1880) NBR 222

In leaves of *Alopecurus pratensis*

England: Surrey, Leatherhead, 12 May 1946, R.W.G. Dennis, K(M)106296.

Known in Britain from the single collection cited, previously not distinguished from *U. agropyri* from which it differs in larger spores and a complete layer of sterile cells. Occurs on various species of *Alopecurus* in Europe and Asia (Vánky, 1994).

*Urocystis avenae-elatioris* (Kochman) Zundel, *Ustilaginales of the World*: 311 (1953) NBR 223

In leaves of *Arrhenatherum elatius*.

Known in Britain only from 3 collections from Norfolk (Ludham, 4 June 1936, E.A. Ellis 1675, K(M) 132814; Old Lakenham, 5 June 1941, E.A. Ellis, K(M) 116430; Blofield, 10 June 1944, E.A. Ellis, K(M)106297).

Previously not distinguished from *U. agropyri*. Occurs only on this host grass.

*Urocystis bolivari* Bubák & Gonz. Frag., Bol. Real. Soc. Esp. Hist. Nat. 22: 205 (1922) NBR 224

In leaves and culms of *Lolium perenne*.

A single collection (Oxfordshire, Henley, Nettlebed Estate, June 1970, M.A. Ali, K(M)106298).

Previously not distinguished from *U. agropyri*. Known only from *Lolium perenne*, and elsewhere in Europe and Asia, on *L. rigidum* (Vánky, 1994).

*Urocystis melicae* (Lagerh. & Liro) Zundel, *Ustilaginales of the World*: 326 (1953) NBR 225

In leaves of *Melica uniflora*.

A single collection (Surrey, Mickleham, 14 June 1990, A. Henrici, K(M)23279). Occurs on various *Melica* species in Europe and Asia.

*Urocystis poae* (Liro) Padwick & A. Khan, *Mycol. Pap.* 10: 2 (1944) NBR 226

In leaves and sheaths of *Poa* sp.

Known in Britain from a single collection (Scotland, Aberdeenshire, Peterhead, on *Poa pratensis*, A. Smith, July 1933, K(M)106300) originally referred to *U. occulta*. The species has a world-wide distribution *vide* Vánky (1994), on various *Poa* species.

***Urocystis primulae*** (Rostr.) Vánky, *Symb. Bot. Upsal.* 24: 176 (1985) NBR 227

In ovaries of *Primula vulgaris* & *P. veris*

Widespread in Britain, but previously not distinguished from *U. primulicola* Magnus from which it differs in larger spores and spore balls, and in host species (*Primula* subgen. *Primula*). *Urocystis primulicola*, restricted to *P.* subgen. *Aleurita* (Vánky, 1994), occurs in Britain only on *P. farinosa* and is rare, known only from two old collections (Co. Durham, Teesdale, Aug. 1867, ex Herb. Broome, K(M)107530; Derbyshire, Malpas, Edge Hall, C. Wolley-Dod, Aug. 1904, K(M)132834).

***Urocystis trollii*** Nannf., *Symb. Bot. Upsal.* 16: 100 (1959) NBR 228

In leaves of *Trollius europaeus* and *T.* sp. cult.

The smut on this host genus was first reported in Britain from the Isle of Arran (Wilson, 1927; as *Urocystis anemones*), on *T. europaeus*. There is an earlier collection on *T. asiaticus* (Warwickshire, Sutton, 20 June 1908, ex Herb. W.B. Grove, K(M)106989), and more recently it has been collected on *T. x cultorum* (Norfolk, K(M)107510). It has also recently been recollected on native *T. europaeus* (Glamorganshire, Cwm Cadlan, 8 July 1998, K(M)105985). The species was not separated from *U. ficariae* by Mordue & Ainsworth (1984).

***Urocystis ulei*** Magnus, *Hedwigia* 17: 89 (1878) NBR 229

In leaves of *Festuca* spp.

England: Lincolnshire, Skegness, on *Festuca rubra* ssp. *arenaria*, E.C. Wallace, June 1942, K(M)118801; Wiltshire, Woodborough, Vale of Pewsey, on *F. arundinacea*, R.W.G. Dennis, 24 Nov. 1973, K(M)118802; Devon, Branscombe, on *F. arundinacea*, J. Webster, 25 June 1970, K(M)107017.

Scotland, East Lothian, Gullane, 13 July 1955, D.M. Henderson 2057, K(M)107505.

Previously not distinguished from *U. agropyri*. Widespread on various *Festuca* species in Europe, Asia and North America (Vánky 1994).

## USTILAGINALES

***Anthracoidea capillaris*** Kukkonen, *Ann. Bot. Soc. Zool.-Bot. Fenn.* 'Vanamo' 34: 50 (1963) NBR 230

In ovaries of *Carex capillaris*.

Known in Britain from a single old collection (Scotland, Aberdeenshire, Craig Koynoch, W. Gardiner, July 1844, det. A. Bennell, K(M)106269) previously referred to *A. caricis*. It occurs only on this host species, but is widespread in Europe, parts of Asia and North America (Vánky 1994).

***Anthracoidea pseudoirregularis*** Braun, *Boletus* 6: 52 (1982) NBR 231

In ovaries of *Carex pallascens*.

Restricted to this host species, and known only from parts of Northern Europe (Vánky 1994; Scholz & Scholz 1988). A single British collection (Scotland, Isle of Mull, Calgary Bay, 7 July 1966, P.W. James & J. Cannon, det. A. Bennell, K(M)106280) previously referred to *A. caricis*.

***Schizonella cocconi*** (Morini) Liro, *Ann. Acad. Sci. Fenn., Ser. A*, 42: 52 (1938) NBR 232

In leaves of *Carex flacca*.

Known in Britain from just two collections (Scotland, Bal-later, Coyles of Muick, 20 Jun 1951, N.F. Robertson, K(M)107470; Channel Islands, Guernsey, Vazon Bay, 6 July 1939, E.A. Ellis, K(M)6386). Previously not distinguished from *S. melanogramma* but differing in its slightly larger ustilospores aggregated when young into irregular balls rather than pairs. *Schizonella melanogramma* is evidently also very rare in Britain, known from just a single collection (Suffolk, Icklingham, Fox-hole Heath, 13 May 1951, D.C. Buxton, K(M)107471). It occurs here on *C. ericetorum* and elsewhere in Europe on other species of *Carex*, but is not found on *C. flacca*.

***Thecaphora lathyri*** J.G. Kühn, in Rabenhorst, *Fungi Europaei* IV: 1797 (1874) NBR 233

In seeds of *Lathyrus pratensis*.

Scarce and known only from a few localities in Scotland, where it was first reported by Wilson (1924), and from Suffolk (Haverhill, 22 Jul. 1998, B. Wurzell, det. T.F. Preece TFP7117, K(M)105977). Until recently placed as a synonym of *T. deformans* which in England has been reported only from seeds of *Ulex minor* (Brett 1966) but in Europe occurs in seeds of *Medicago* spp.

***Ustanciosporium*** Vánky emend M. Piep., *Nova Hedwigia* 70: 330 (2000)

The genus comprises inflorescence smuts with sori which surround the tip of sterile spikelets, and is restricted to *Cyperaceae*. It is almost worldwide in distribution, and currently includes 23 species, many previously placed in *Cintractia*, most of which are described in Piepenbring (2000). Two species occur in Britain, both infecting ovaries of *Rhynchospora alba*. These smuts are evidently very scarce here and lack recent collections. They have been previously either referred to *Cintractia montagnei* or not separated from *Anthracoidea caricis*.

***Ustanciosporium gigantosporum*** (Liro) M. Piep. & Begerow, *Nova Hedwigia* 70: 339 (2000) NBR 234

In inflorescence of *Rhynchospora alba*.

England: Cambridgeshire, Gamlingay, undated, J.S. Henslow (Notices of British Fungi 479), K(M)107346; Berkshire, Ascot, 22 Nov. 1865, K(M)107349 (2 packets).

The species is widespread in Europe, Russia and North America (Piepenbring 2000).

***Ustanciosporium majus*** (Desm.) M. Piep., *Nova Hedwigia* 70 (3-4): 341 (2000) NBR 235

In inflorescence of *Rhynchospora alba*.

Republic of Ireland: Galway, Connemara, unlocalised, 8 Sept. 1959, N.A. Burges (as *Cintractia caricis*), K(M) 107350.

England: Wiltshire, West Grimstead, 15 Sept. 1894, ex Herb. W.B. Grove, K(M)107352; Dorset, Stoborough (nr. Wareham), 26 Aug. 1939, K(M)107351

Worldwide in distribution (Piepenbring 2000). Differs from *U. gigantosporum* in smaller spores (mostly 14 – 17 µm cf. 18 – 21 µm across).

***Ustilago corcontica*** (Bubák) Liro, *Ann. Acad. Sci. Fenn., Ser. A*, 17: 383 (1924) NBR 236

*Tilletia corcontica* Bubák, *Arch. Přír. Výzk. Čech.* 15: 47 (1912)

England: Norfolk, Surlingham, Wheatfen Broad, in leaves & culms of *Calamagrostis canescens*, 18 June 1939, E.A. Ellis, IMI 32329; same locality & host, 9 July 1944, E.A. Ellis, IMI 10999.

Spores brown, subglobose to broadly ellipsoid or slightly angular in outline, 12 – 16 (- 19) × 10 – 12 µm (excl. ornament),

verruculose-echinulate, ornament comprising isolated, tapered spines c. 0.8 – 1 µm high.

The leaf stripe smuts on *Calamagrostis* were discussed by Nannfeldt (in Lindeberg 1959) who recognised three species and examined and discussed the two collections cited above. These he distinguished from *U. striiformis* on the basis of spore characters and referred to *U. corcontica* which occurs typically on *Calamagrostis villosa*. Only one of these collections (IMI 32329) was noted by Ainsworth & Sampson (1950), and by Mor-due & Ainsworth (1984), who referred it to *U. serpens*. On this basis, *Calamagrostis canescens* was cited as a host for *U. serpens* in Legon *et al.* (2005).

Although Vánky (1994) placed *U. corcontica* as a synonym of *U. striiformis*, it seems more closely akin to *U. calamagrostidis*. According to Nannfeldt (in Lindeberg 1959), *U. calamagrostidis* occurs only on *C. epigeios* (and its hybrid with *Ammophila*, x *Calammophila baltica*), differing from *U. corcontica* in slightly larger spores with longer spines. Spores of *U. striiformis*, plurivorous on a wide range of grasses, are markedly smaller than those of *U. corcontica* (9 – 12 × 7.5 – 9 (- 10) µm, on *Agrostis stolonifera*, Surrey, Richmond, 4 June 1955, R.W.G. Dennis, K(M) 134461; 9 – 12 (- 14) × 7.5 – 10 µm, on *Holcus mollis*, Wales, Breconshire, Llysdmain, 4 May 2002, R.G. Woods, K(M) 109805, excl. ornament), with more regular, lower and less pointed warts not more than c. 0.8 µm high. Nannfeldt (in Lindeberg 1959) was unable to confirm *U. striiformis* from *Calamagrostis* and doubted its occurrence on this host genus. Accordingly, the name *U. corcontica* is used here for the smut on *Calamagrostis canescens*.

A smut on *C. canescens* was also reported by Bramley (1985) from Yorkshire and was similarly referred to *U. serpens* (as *U. macrospora*). It may have also represented *U. corcontica* but the collection has apparently not been preserved.

One further, and more recent, collection of a smut on *C. canescens* is known in Britain, and this proves to represent a different species, *U. scrobiculata*, discussed below.

*Ustilago echinata* J. Schröt., *Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss. (Naturwiss.-Med. Abth.)* 1869-72: 4 (1870) NBR 237

In leaves & shoots of *Phalaris arundinacea*, causing considerable distortion.

Apparently rare in Britain, first reported from Devon (Slapton Ley) by Spooner & Edwards (1987, as *U. serpens*), now also known from single collections from Surrey (Runnymede, 14 July 2001, N.W. Legon, K(M)86809) and Republic of Ireland (Co. Mayo, Turlough, 7 Aug. 1999, R.H. Disney, K(M) 105995). Distinguished from *U. striiformis*, which occurs rarely on this host, by larger, more coarsely ornamented spores. *Ustilago serpens* (P. Karst.) Lindeb. differs from *U. echinata* in its less coarsely ornamented spores, and is evidently restricted to species of *Bromus* and *Elymus* (Vánky 1994).

*Ustilago scrobiculata* Liro, *Ann. Acad. Sci. Fenn., Ser. A*, 17: 68 (1924). NBR 238

England: Norfolk, Foxley Wood, in leaves & culms of *Calamagrostis canescens*, 17 June 1970, E.A. Ellis, IMI 149538.

Not previously reported from Britain and known as yet from the single collection cited. In this collection, spores measure 11 – 18 × 10 – 13 µm (excluding ornament) and are dark brown, subglobose to broadly ellipsoid or rather irregular in form, with a conspicuous ornament of irregular, often anastomosing ridges forming a partial reticulum, c. 1 µm high. The

ornament is quite different from that of *U. corcontica* (see above), also on this host grass, but sori in leaves and culms seem scarcely distinguishable in these two species. *Ustilago scrobiculata*, known in Europe and Asia, occurs only on species of *Calamagrostis* and can be readily distinguished from other smuts on this host genus by spore characters (illustrated in Vánky 1994).

## UREDINIOMYCETES

### MICROBOTRYALES

The so-called 'anther smuts' commonly found in members of the Caryophyllaceae and previously referred to *Ustilago violacea* (Pers.) Roussel, have been shown to comprise a complex of several host-restricted species (Deml & Oberwinkler 1982; Scholz & Scholz 1988; Vánky 1994, 1998). Furthermore, these smuts have been shown not to belong in *Ustilago* (Deml & Oberwinkler 1982), which is restricted to monocot. hosts, but, based on molecular evidence (Begerow *et al.* 1997), to be more closely allied with the Urediniomycetes. The genus name *Microbotryum* Lév. emend Deml & Oberw. (Deml & Oberwinkler 1982), typified by *U. violacea*, is available for them and represents the type of the order Microbotryales Bauer & Oberw. (in Bauer *et al.* 1997). *Microbotryum* is restricted to dicot. hosts, and its distinguishing characters further discussed by Vánky (1994, 1998). It was considerably extended by Deml & Prillinger (in Prillinger *et al.* 1991) and by Vánky (1998) to include many additional species previously referred to *Ustilago* and occurring on other dicot. host families. Some of these also occur in Britain, and are noted below.

Three other genera of British smuts, *Bauerago* Vánky, *Sphaecelotheca* de Bary, and *Ustilentyloma* Savile have also been referred to Microbotryales (Bauer *et al.* 1997; Vánky, 1999). In Britain, *Bauerago* is represented by *B. vuyckii* (Oudem. & Beij.) Vánky, in ovaries of *Luzula* spp. This was recently reported as British from *L. campestris* (Smeathers 1998) and as yet is known here from only a single collection. *Ustilentyloma* species may resemble species of *Entyloma* but exhibit significant ultrastructural differences discussed by Bauer *et al.* (1997). The genus currently comprises just three species, all on grass hosts, and is represented here by *U. brefeldii*, not previously reported from Britain.

Six species of the *M. violaceum* complex other than *M. violaceum* itself can be recognised in Britain, viz.:

*Microbotryum dianthorum* (Liro) H. Scholz & I. Scholz, *Englera* 8: 206 (1988) NBR 239

In anthers of cultivated *Dianthus* spp.

*Microbotryum lychnidis-dioicae* (Liro) Deml & Oberw., *Phytopathol. Z.* 104: 353 (1982) NBR 240

In anthers of *Silene dioica* & *S. latifolia*.

*Microbotryum major* (J. Schröt.) Deml & Oberw., *Phytopathol. Z.* 104: 353 (1982) NBR 241

In anthers of *Silene otites*.

*Microbotryum saponariae* M. Lutz, Göker, M. Piatek, Kemler, Begerow & Oberw., *Mycological Progress* 4: 233 (2005) NBR 249

In anthers of *Saponaria officinalis*

England: Cambridgeshire, Cambridge, Acrefield Drive, 9 Aug. 1998, U. Allitt, K(M)58220

A single British specimen, previously referred to *M. violaceum* from which the *Saponaria* smut was not distinguished

by Vánky (1994, 1998). The spore mass of *M. saponariae* is brown-violaceous, slightly darker than in other members of this complex from which it is distinguished otherwise by host, occurring only on *Saponaria* spp. and on evidence from molecular data. It is scarcely distinct morphologically. Spores are globose to subglobose, 6.2 – 7.5 µm diam. in the British specimen, and have a fine, reticulate ornament, with (4-) 5 – 7 meshes across the spore diameter.

***Microbotryum silenes-inflatae*** (DC. ex Liro) Deml & Oberw., *Phytopathol. Z.* 104: 354 (1982) NBR 242

In anthers of *Silene inflata* & *S. vulgaris*.

***Microbotryum stellariae*** (Liro) Deml & Oberw., *Phytopathol. Z.* 104: 354 (1982) NBR 243

*Ustilago stellariae* Liro

*Farinaria stellariae* Sowerby, nom. inval.

In anthers of *Myosoton aquaticum*, *Stellaria graminea*, *S. holostea* & *S. uliginosa*.

Other British species of Microbotryales:

***Microbotryum anomalum*** (G. Winter) Vánky, *Mycotaxon* 67: 39 (1998)

*Ustilago anomala* G. Winter

In swollen flowers of *Fallopia convolvulus*. Also in *Bilderdykia* spp. elsewhere.

***Microbotryum bistortarum*** (DC.) Vánky, *Mycotaxon* 67: 40 (1998)

*Ustilago bistortarum* (DC.) Körn.

In swollen flowers and bulbils of *Polygonum bistorta* & *P. viviparum*.

***Microbotryum cordae*** (Liro) Deml & Prillinger, *Bot. Acta* 104: 10 (1991) NBR 244

*Ustilago cordae* Liro

In swollen, deformed ovaries of *Persicaria hydropiper* and *P. maculosa*.

England: Surrey, Esher, Arbrook Common, 23 Sept. 1990, in ovaries of *P. hydropiper*, B.M. Spooner, K(M)15152; East Norfolk, Surlingham, Wheatfen Broad, 5 Oct. 1934, in ovaries of *P. hydropiper*, E.A. Ellis & W.B. Grove (as *U. utriculosa*), K(M)103749.

Scotland: South Ebeudes, Isle of Colonsay, Scalasaig, 17 Sept. 1976, in ovaries of *P. persicaria*, R.W.G. Dennis, K(M)107536.

Republic of Ireland: South Kerry, Killarney, Muckcross Demesne, 1 Sept. 1946, in ovaries of *P. hydropiper*, P. O'Connor, K(M)107535.

Northern Ireland: Down, Hillsborough, 17 Sept. 1948, in ovaries of *P. maculosa*, G.C. Ainsworth, K(M)107537.

Widespread. Previously not separated from *U. utriculosa* ss. auct. (= *U. reticulata* Liro; in swollen, deformed ovaries of *P. lapathifolia*), from which it is distinguished by the more finely meshed spore ornament (Vánky 1994). In Europe also on *Persicaria minus* and *P. mite*.

***Microbotryum duriaeanum*** (Tul. & C. Tul.) Vánky, *Mycotaxon* 67: 43 (1998) NBR 245

*Ustilago duriaeanum* Tul. & C. Tul.

In capsules of *Cerastium glomeratum*.

England: North Essex, Chelmsford, Rainsford End, May 1902, K(M)106945.

Although evidently very rare or perhaps overlooked in Britain, this is a widespread species, found in much of Europe, Asia, N. Africa and N. America on various members of

Caryophyllaceae subfam. Alsinoideae (Vánky 1994). The specimen cited, originally referred to *Ustilago violacea* (= *Microbotryum violaceum*), is the only confirmed British collection. It can be readily distinguished from *Microbotryum* in anthers of *Cerastium* and related host genera (i.e. *M. stellariae*) by its larger spores, 11 – 15 µm diam.

Two collections of a smut on *Moenchia erecta* from Wales, Montgomeryshire (A. Jones, 2 Jun. 1997, K(M)106050; 15 May 1998, K(M)106303) may also belong here but if so represent a new host for this species. In these collections spores measure 10 – 12 µm diam. (excluding ornament) with 6 – 7 meshes across the diameter, meshes 2 – 2.5 µm across, walls 1 – 1.5 µm high. *Ustilago moenchiae-manticae* Lindtner, in capsules of *Moenchia mantica*, has larger spores and is the only smut otherwise known from this host genus

***Microbotryum flosculorum*** (DC.) Vánky, *Mycotaxon* 67: 43 (1998)

*Ustilago flosculorum* (DC.) Fr.

In anthers of *Knautia arvensis* & *Succisa pratensis*.

***Microbotryum intermedium*** (J. Schröt.) Vánky, *Mycotaxon* 67: 44 (1998)

*Ustilago intermedia* J. Schröt.

In anthers of *Scabiosa columbaria*.

***Microbotryum kuehneanum*** (R. Wolff) Vánky, *Mycotaxon* 67: 45 (1998)

*Ustilago kuehneana* R. Wolff

In leaves, stems and flowers of *Rumex acetosella*.

***Microbotryum marginale*** (DC.) Vánky, *Mycotaxon* 67: 45 (1998) NBR 246

*Ustilago marginalis* (DC.) Lév.

In leaves of *Persicaria bistorta*.

England: Worcestershire, Forhill, 21 Apr. 1921, W.B. Grove (as *U. bistortarum*), K(M)107549.

Sori restricted to and surrounding the margin of the host leaves. Perhaps known in Britain only from the single collection cited, previously identified with *Ustilago bistortarum* (DC.) Körnicke and erroneously referred in Legon et al. (2005) to *U. pustulata* (= *Microbotryum pustulatum*).

The leaf smuts on *Persicaria* Sect. *Bistorta* have been much confused and referred usually to *U. bistortarum* (e.g. Wilson 1924; Sampson 1940; Mordue & Ainsworth 1984) although that name *vide* Vánky (1994) should apply to the smut previously known as *Sphacelotheca inflorescentiae* occurring in the flowers and bulbils. In Britain this latter species is also rare, being known only on *Persicaria vivipara* from a few collections from Scotland. *Microbotryum pustulatum* forms rounded sori in the leaf blade of both *P. bistorta* and *P. vivipara* in Europe and elsewhere. No British collections referable to this species are preserved in K but the smut reported by Wilson (1924) in leaves of *P. vivipara* from Perthshire presumably belongs here.

A leaf smut of *Persicaria amphibia* reported from Yorkshire by Bramley (1985) and included by Mordue & Ainsworth (1984) as *U. bistortarum* is presumably based on an error of host identification. No material has been traced and no leaf smut of this host species is known.

***Microbotryum parlatorei*** (A.A. Fisch. Waldh.) Vánky, *Mycotaxon* 67: 48 (1998) NBR 247

*Ustilago parlatorei* A.A. Fisch. Waldh.

In stems, leaves and flowers of species of *Rumex* subgen. *Rumex*.

England: Yorkshire, Doncaster, Potteric Carr, 1 Aug. 1937, in stems of *Rumex conglomeratus*, W.G. Bramley, K(M)107507; Malton (near), Marishes, 5 July 1957, in flowers of *R. crispus*, W.G. Bramley, K(M)107266.

Scotland: South Aberdeen, St. Fergus, July 1932 in flowers (ovaries?) of *R. crispus*, A. Smith, K(M)107267.

Previously not distinguished in Britain from *M. kuehneana* R. Wolff to which the above collections were previously referred and from which it differs in the size (up to c. 15 µm diam.) and coarser ornamentation of the spores. *Microbotryum kuehneanum* is restricted to members of *Rumex* subgen. *Acetosella*.

Evidently widespread in Britain, but rare, known only from the three collections cited and not collected since 1957. It may occur in stems, leaves and flowers of the host, causing swelling and distortion of host tissues. The smut occurs more widely in Europe and also throughout the Americas but is very rare *vide* Vánky (1994). *Rumex conglomeratus* is a new host species for it.

***Microbotryum pustulatum*** (DC.) R. Bauer & Oberw., *Canad. J. Bot.* 75: 1309 (1997) NBR 248

*Ustilago pustulata* (DC.) G. Winter  
See above under *M. marginale*.

***Microbotryum reticulatum*** (Liro) R. Bauer & Oberw., *Canad. J. Bot.* 75: 1311 (1997)

*Ustilago reticulata* Liro  
*Ustilago utriculosa* sensu Tul. & C. Tul.

In swollen, deformed flowers of *Persicaria lapathifolia*.

***Microbotryum scabiosae*** Vánky, *Mycotaxon* 67: 52 (1998)  
*Ustilago scabiosae* (Sowerby) G. Winter, comb. inval.

In anthers of *Knautia arvensis*.

***Microbotryum stygium*** (Liro) Vánky, *Mycotaxon* 67: 50 (1998) NBR 250

*Ustilago stygia* Liro  
In flowers of *Rumex acetosa*.

Wales: Carmarthenshire, Llanstephan, Castle Hill, 5 June 1971, R.W.G. Dennis, K(M)107560.

England: Derbyshire, Cromford (nr.), Via Gellia, 5 June 2002, R.G. Woods, K(M)110086; Derbyshire, unlocalised, '1940', K. Sampson, K(M)107564.

Scotland: Mid-Perthshire, Lawers, 21 July 1948, N.Y. Sandwith, K(M)107565.

As with *M. parlatorei* above, not previously separated from *M. kuehneanum*. It differs from that species in its more finely reticulate spore ornament (Vánky 1994) and is restricted to members of *Rumex* subgen. *Acetosella*.

***Microbotryum succisae*** (Magnus) R. Bauer & Oberw., *Canad. J. Bot.* 75: 1311 (1997)

*Ustilago succisae* Magnus  
In anthers of *Succisa pratensis*.

***Microbotryum tragopogonis-pratensis*** (Pers.) R. Bauer & Oberw., *Canad. J. Bot.* 75: 1311 (1997)

*Ustilago tragopogonis-pratensis* (Pers.) Roussel  
In florets of *Tragopogon* spp.

***Microbotryum vinosum*** (Tul. & C. Tul.) Deml & Prillinger, *Bot. Acta* 104: 10 (1991).

*Ustilago vinosula* Tul. & C. Tul.  
In swollen flowers of *Oxyria digyna*.

***Ustilentyloma brefeldii*** (W. Krieger) Vánky, *Mycotaxon* 41 (2): 491 (1991) NBR 251

In leaves of *Arrhenatherum elatius*

Scotland: North Ebeudes, Isle of Skye, Aird, 2 Oct. 1983, R.W.G. Dennis, K(M) 108600.

Introduced as British on the basis of the single collection cited, originally referred to *Entyloma* sp. In this collection the smut is very scant but appears to match this species, with thick-walled spores 12–17 × 9–12 µm, and confirms *Arrhenatherum* as a host. *Ustilentyloma brefeldii* is known elsewhere in Europe on various grasses.

#### EXCLUDED SPECIES

***Urocystis bromi*** (Lavrov) Zundel, *Ustilaginales of the World*: 312 (1953)

Reported in Legon *et al.* (2005) but based on host misidentification. The collection represents *U. agropyri* on *Agropyron repens*.

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