

## British Dermateaceae : 3. Peziculoideae

BRIAN SPOONER<sup>1</sup> & MARIJKE M. NAUTA<sup>2</sup>

<sup>1</sup>*Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE, U.K.*

<sup>2</sup>*Rijksherbarium/Hortus Botanicus, P.O. Box 9514, 2300 RA, Leiden, The Netherlands*

As part of a synopsis of British Dermateaceae a key to the genera of subfamily Peziculoideae is presented, together with descriptions of the genera and keys to the species.

**Keywords:** Peziculoideae, descriptions, keys, Great Britain

This is the third part of a synopsis of the British Dermateaceae which aims to provide keys and descriptions for subfamilies and genera, and keys to species for all genera except *Mollisia* and *Pyrenopeziza*. It follows the format of the previous two parts (Nauta & Spooner 1999a, 1999b). The first of these provided an introduction to the family, with a key to subfamilies and annotated lists of included genera and synonyms and of excluded genera. The second part considered the subfamily Naevioideae, providing keys to genera and species, and descriptions of genera known from Great Britain.

The subfamily Peziculoideae includes two genera, *Pezicula* and *Ocellaria*, and is distinguished by characters of the apothecia, which tend to be brightly coloured, are commonly caespitose and usually have a pruinose hymenium, and by the anamorph. Some members of the Dermateoideae, notably *Dermea*, may be similar in habit, but these have dark brown apothecia and conidial states belonging to different form-genera. The structure of the excipulum in species of *Dermea* also shows closer similarities with other core members of Dermateoideae, such as *Mollisia*.

**Peziculoideae** Nannf. in *Nova Acta Regiae Societatis Scientiarum Upsaliensis* ser. IV (8): 90, 1932.

Apothecia often brightly coloured, sometimes whitish, solitary or clustered, immersed or erumpent, sessile or short-stipitate. Hymenium usually pruinose, sometimes smooth (*Ocellaria*); receptaculum lacking hairs. Outer excipulum a *textura angularis* or *textura globulosa* composed

of pale, subglobose or angular elements with thin or slightly thickened walls. Asci 4 - 8-spored, cylindric, tapered below, rather thick-walled, apex narrowed, rounded or broadly conical, apical pore broad, I+ or rarely I- (i.e. pore blue/violet or not in Melzer's reagent); spores mostly large and broadly ellipsoid or ovoid, hyaline, rarely slightly coloured with age, commonly becoming transversely septate and sometimes muriform, occasionally budding microconidia; paraphyses filiform, sometimes enlarged at the apex, often overtopping the asci, sometimes forming a pseudoeptithecium.

Anamorph sometimes present, in form genera *Cryptosporiopsis* or *Phlyctema*. Saprophytic or parasitic on woody substrata, rarely on herbaceous stems.

### Key to genera of Peziculoideae recognised in Great Britain

1. Apothecia erumpent, usually clustered; hymenium pruinose; paraphyses overtopping the asci, not agglutinated.....**Pezicula**
- 1'. Apothecia immersed, partly erumpent, solitary; hymenium not pruinose; paraphyses agglutinated, forming a yellowish pseudoeptithecium.....**Ocellaria**

### Generic descriptions and keys to species in Peziculoideae

**Pezicula** Tul. & C. Tul., *Selecta Fungorum Carpologia* III: 182, 1865 (nom. cons., non Paulet, 1791).

Type: *Peziza carpineae* Pers.

Apothecia usually clustered or caespitose, rarely solitary, erumpent, mostly brightly coloured, sometimes grey or whitish, disc plane or convex; hymenium pruinose. Outer excipulum a *textura angularis* or *textura globulosa* composed of thin-

walled, subglobose to angular elements with pale walls. Asci broadly cylindric, 4 - 8-spored, I+ or rarely I-; spores hyaline (later brownish in *P. dennisii*), ovoid to ellipsoid or broadly ellipsoid, sometimes inequilateral, commonly transversely 1 - several septate, sometimes muriform, occasionally budding microconidia. Paraphyses filiform, sometimes branched, commonly enlarged at the apex and overtopping the asci.

Anamorph sometimes present, in form genera *Cryptosporiopsis* and *Phlyctema*.

Saprophytic or parasitic on woody substrata, rarely on herbaceous stems.

Lit.: Boerema & Gremmen, 1959; Dennis, 1974; Fisher & Petrini, 1990; Groves, 1938, 1939, 1940, 1941; Guthrie, 1959; Hawksworth & Sivanesan, 1976; Johansen, 1949; Seaver & Velazquez, 1933; Sharples, 1959; Wollenweber, 1939.

In general, apothecia of the various species of

*Pezizaceae* in the UK are very similar in appearance, and consequently, identification of species based solely on the

apothecial state can prove difficult. In the following key, substratum and, in some cases,

characters of the anamorphic state have, therefore, been used as additional characters to

distinguish species. The genus is in need of a thorough revision. It may be noted that *Pezizula*

*dennisii* with whitish apothecia on *Urtica*, may prove to be inappropriately placed in this genus, but further study is required before reconsidering its taxonomic position, and it is here maintained in *Pezizula*.

Number of species: 22 in GB, 50+ in total.

Species in Great Britain:

*Pezizula acericola* (Peck) Sacc.; Anamorph: *Cryptosporiopsis* sp.

*Pezizula alba* E. J. Guthrie; Anamorph: *Phlyctema vagabunda* Desm.

*Pezizula alni* Rehm; Anamorph: *Cryptosporiopsis* (?) sp.

*Pezizula amaena* Tul. & C. Tul.; Anamorph: *Cryptosporiopsis amaena* (Höhn.) Petr.

*Pezizula carnea* (Cooke & Ellis) Rehm (= *Dermatea pseudoplatani* W. Phillips); Anamorph: *Cryptosporiopsis* sp.

*Pezizula carpinea* (Pers.) Tul. & C. Tul. (= *Pezizula fagi* (W. Phillips) Boud.); Anamorph: *Cryptosporiopsis fasciculata* (Tode) Petr.

*Pezizula cinnamomea* (DC.) Sacc. (= *Pezizula dryina* (Cooke) Sacc.; *P. quercina* (Fuckel) Fuckel); Anamorph: *Cryptosporiopsis grisea* (Pers.) Petr.

*Pezizula corticola* (C. A. Jørg.) Nannf.; Anamorph: *Cryptosporiopsis corticola* (Edgerton) Nannf.

*Pezizula coryli* (Tul. & C. Tul.) Tul. & C. Tul.; Anamorph: unknown

*Pezizula dennisii* L. Hawksw.; Anamorph: unknown

*Pezizula denisii* L. Hawksw.; Anamorph: unknown

*Pezizula frangulae* (Fr.) Fuckel; Anamorph: *Cryptosporiopsis versiformis* (Alb. & Schwein.) Wollenw.

*Pezizula houghtoni* (W. Phillips) J. W. Groves; Anamorph: unknown

*Pezizula livida* (Berk. & Broome) Rehm (= *Pezizula eucrita* (P. Karst.) P. Karst.; *P. conigena* (W. Phillips) Rehm; *P. larioicola* Fuckel; *P. nectrioides* (W. Phillips) Sacc.); Anamorph: *Cryptosporiopsis abietinum* (Rost.) Petr.

*Pezizula malicorticis* (H. S. Jacks.) Nannf. (= *Neofabraea perennans* Kienh.); Anamorph: *Cryptosporiopsis malicorticis* (Cordley) Nannf.

*Pezizula myrtilina* P. Karst. (= *Orbilia boydii* A. L. Sm. & Ramsb.); Anamorph: unknown

*Pezizula paradoxa* Dennis; Anamorph: unknown

*Pezizula pruinosa* Farl.; Anamorph: *Lagynodella pruinosa* (Peck) Petr. (= *Cryptosporiopsis* sp.)

*Pezizula rhododendri* Remler; Anamorph: unknown

unknown

*Pezicula rubi* (Lib.) Niessl (= *Pezicula rhabarbarina* (Berk.) Tul. & C. Tul.); Anamorph: *Cryptosporiopsis phaeosora* (Sacc.) Arx

*Pezicula scoparia* (Cooke) Dennis; Anamorph: unknown

*Pezicula sepium* (Desm.) Dennis (= *P. crataegi* (Lasch) Fuckel); Anamorph: *Cryptosporiopsis pyri* (Fuckel) Petr.

*Pezicula subcarnea* J. W. Groves; Anamorph: *Cryptosporiopsis* sp.

### Key to British species of *Pezicula*

1. Apothecia on bark or cones of conifers; asci 4 - 8-spored, < 20 µm wide [spores 21-41 x 5-9 µm]. *P. livida*
- 1.' Apothecia on bark, stems or leaves of angiosperms; asci 4- or 8-spored, width various.....2
2. On dead stems of *Urtica*; hymenium whitish to pale yellowish; ascus mean width < 15 µm [spores 19-24 x 8-10 µm; 0-1-septate].....*P. dennisii*
- 2.' On stems or leaves of trees or shrubs; hymenium more deeply pigmented; ascus mean width and spore size various.....3
3. On *Rosaceae*.....4
- 3.' On other host families.....10
4. On *Malus* or *Pyrus*, often associated with cankers.....5
- 4.' On other host genera, not associated with cankers.....7
5. Ascospores commonly 5 (- 6)-septate, 20-30 x 7-10 µm; conidia markedly curved to vermiform, 16-27 x 2.5-4 µm.....*P. alba*
- 5.' Ascospores often non-septate, 1-3-septate with age, 13-31 x 4.5-15 µm; conidia not markedly curved nor vermiform.....6
6. Ascospores 13-23 x 4.5-8 µm; conidia 11.5-16(-21) x 3-4 µm.....*P. malicorticis*
- 6.' Ascospores 17-31 x 7-15 µm; conidia 26-42 x 7.5-10 µm.....*P. corticola*
7. On *Rubus* or *Rosa* [spores 15-30 x 5-8 µm].....*P. rubi*
- 7.' On *Prunus* or *Crataegus*.....8
8. Asci commonly 80-110 x 12-18 µm; spores mostly 6-9 µm wide (length 14-30 µm); on *Prunus spinosa*.....*P. pruinosa*
- 8.' Asci commonly 120-160 x 19-26 µm; spores mostly 9-13 µm wide (length (16-)20-30(-33) µm); on *Crataegus* or *Prunus lusitanica*.....9
9. Apothecia not strongly erumpent, yellow-brown pruinose margin present; on *Crataegus*.....*P. sepium*

- 9.' Apothecia distinctly erumpent, margin lacking; on *Prunus lusitanica*.....*P. houghtonii*
10. Apothecial flesh deep yellow to red-brown, or hymenium containing granules staining dark red-brown in Melzer's reagent.....11
- 10.' Apothecial flesh pale, whitish to buff, or pale ochraceous; hymenium not obscured by granules.....15
11. Hymenium obscured by granules staining red-brown in Melzer's reagent; spores mostly 18-25 x 6-9 µm on *Acer pseudoplatanus*.....*P. carnea*
- 11.' Hymenium not obscured by granules; spores in range 16-40 x 6-11 µm on other hosts.....12
12. On various hosts other than *Corylus*; disk cinnamon to red-brown.....*P. cinnamomea*
- 12.' On *Corylus*; disc yellow.....13
13. Asci 130-150 x 20-25 µm, spores (20-)28-40 x (7-)8-11 µm.....*P. paradoxa*
- 13.' Asci 85-125 x 14-20 µm, spores 15-30 x 6-10 µm.....14
14. Apothecia pale yellow, not strongly erumpent. Conidiomata pulvinate; conidia 9-10.5 µm wide [spores 20-30 x 6-9 µm].....*P. coryli*
- 14.' Apothecia bright yellow, strongly erumpent. Conidiomata cylindric to conical; conidia 7.5-8.5 µm wide (only *Cryptosporiopsis* anamorph known in Great Britain) [spores 15-27.5 x 6.5-10 µm].....*P. corylina*
15. Asci 4-spored; apothecia drying almost black; spores 3-5-septate, often muriform, 19-25 x 7-10 µm; on *Frangula*, *Rhamnus*.....*P. frangulae*
- 15.' Asci 8-spored (rarely some 4-spored asci also present); apothecia not drying almost black; spore septation and size various; on other host genera.....16
16. On *Ericaceae*.....17
- 16.' On other host families.....18
17. Spores mostly 7-9 µm wide (length 18-36 µm); asci > 15 µm wide; on fallen leaves and twigs of *Rhododendron*.....*P. rhododendri*
- 17.' Spores mostly 4-6 µm wide (length 16-25 µm); asci < 15 µm wide; on branches of *Vaccinium myrtillus*.....*P. myrtillina*
18. Asci < 15 µm wide, spores 5-6.5 µm wide (length 16-21 µm); on *Quercus*.....*P. amaena*
- 18.' Asci > 15 µm wide, spores 7-14 µm wide (length 17-40 µm); on other host genera.....19
19. On *Acer*.....20
- 19.' On other host genera.....21
20. Asci 15-19 (-24) µm wide, spores mostly 8-10 µm wide (22-37 x 7.5-11 µm); on *Acer campestre*, *A. platanoides*.....*P. acericola*
- 20.' Asci 21-30 µm wide, spores mostly 10-14 µm wide (21-40 x 10-15 µm); on *Acer pennsylvanica* (only *Cryptosporiopsis* anamorph known in Great Britain).....*P. subcarnea*

21. Asci commonly 130-190  $\mu\text{m}$  long; spores up to 14  $\mu\text{m}$  wide, 0 (-3)-septate, not becoming muriform; on *Carpinus* and *Fagus*.....**P. carpinea**
- 21.' Asci commonly 9-130  $\mu\text{m}$  long; spores not over 10  $\mu\text{m}$  wide, 0-6-septate, becoming muriform or not; on other hosts.....22
22. On *Alnus*; spores mostly 15-22  $\mu\text{m}$  long, 0-3-septate, not or rarely becoming muriform (only *Cryptosporiopsis* anamorph known in Great Britain).....**P. alni**
- 22.' On *Cytisus* and *Ulex*; spores mostly 20-30  $\mu\text{m}$  long, becoming up to 6-septate and sometimes muriform.....**P. scoparia**

**Ocellaria** (Tul. & C. Tul.) P. Karst., *Mycologia Fennica*: 21, 1871.

Type: *O. ocellata* (Pers.) J. Schröt.

Apothecia solitary, immersed or partly erumpent; hymenium not pruinose. Outer excipulum a *textura angularis* or *textura globulosa*, composed of pale, mostly thin-walled elements. Asci broadly cylindric, (4-) 8-spored, apical pore I+; spores mostly broadly ellipsoid, sometimes inequilateral, hyaline, non-septate or occasionally with 1 - several transverse septa. Paraphyses agglutinated, forming a pseudo-epithecium.

Anamorph *Cryptosporiopsis* or unknown/lacking.

Saprophytic on woody substrata.

Lit.: Wollenweber, 1939

Number of species: 2 in GB, c. 5 in total

Species in Great Britain:

*O. ocellata* (Pers.) J. Schröt. (= *O. aurea* Tul. & C. Tul.) Anamorph: *Cryptosporiopsis scutellata* (G. H. Otth) Petr.

*O. masseeana* Sacc. & Syd. (= *O. succinea* Massee)

Excluded name:

*O. punctiformis* (Pers.) Sacc. (= *Cryptodiscus*

*pallidus* (Pers.) Corda; British record based on *C. foveolaris* (Rehm) Rehm *teste* Sherwood (1977)

### Key to British species of Ocellaria

1. Ascospores 20-30 (-40) x 8-14  $\mu\text{m}$ ; on *Salix*, rarely on *Populus*, *Crataegus* or *Sorbus*.....**O. ocellata**
- 1.' Ascospores 14-16 x 6  $\mu\text{m}$ ; on *Fagus*.....**O. masseeana**

### References

- Boerema, G. H. & Gremmen, J. (1959) Een oppervlakkige bastkanker bij appel en peer veroorzaakt door *Pezicula corticola*. *Tijdschrift over Plantenziekten* **65**: 165-176.
- Dennis, R. W. G. (1974) New or Interesting British Microfungi, II. *Kew Bulletin* **29**: 157-179.
- Fisher, P. J. & Petrini, O. (1990) A comparative study of fungal endophytes in xylem and bark of *Alnus* species in England and Switzerland. *Mycological Research* **94**: 313 - 319.
- Groves, J. W. (1938) The Perfect Stage of *Catinula turgida*. *Mycologia* **30**: 46-53.
- Groves, J. W. (1939) Some *Pezicula* species and their conidial stages. *Canadian Journal of Research C* **17**: 125-143.
- Groves, J. W. (1940) Three *Pezicula* species occurring on *Alnus*. *Mycologia* **32**: 112-123.
- Groves, J. W. (1941) *Pezicula carnea* and *Pezicula subcarnea*. *Mycologia* **33**: 510-522.
- Guthrie, E. J. (1959) The occurrence of *Pezicula alba* sp. nov. and *P. malicorticis*, the perfect states of *Gloeosporium album* and *G. perennans*, in England. *Transactions of the British Mycological Society* **42**: 502-506.
- Hawksworth, D. L. & Sivanesan, A. (1976) New and interesting microfungi from Slapton, South Devonshire: Ascomycotina II. *Transactions of the British Mycological Society* **67**: 39-49.
- Johansen, G. (1949) The Danish species of the Discomycete genus *Pezicula*. *Dansk Botanisk Arkiv* **13**(3): 1-26.
- Nauta, M. M. & Spooner, B. (1999a) British Dermateaceae: 1. Introduction. *Mycologist* **13**: 3-6.
- Nauta, M. M. & Spooner, B. (1999b) British Dermateaceae: 2. Naevioideae. *Mycologist* **13**: 65-69.
- Seaver, F. J. & Velazquez, J. (1933) *Dermea* and *Pezicula*. *Mycologia* **25**: 139-148.
- Sharples, R. O. (1959) Observations on the perfect state of *Gloeosporium perennans* in England. *Transactions of the British Mycological Society* **42**: 507-512.
- Sherwood, M. A. (1977). The Ostropalean Fungi. *Mycotaxon* **5**: 1-277.
- Wollenweber, H. W. (1939) Diskomyzetenstudien (*Pezicula* Tul. und *Ocellaria* Tul.). *Arbeiten aus der biologischen Reichsanstalt für Land- und Forstwirtschaft* **22**: 521-570.