

SEPTUM / PORE CAP

Characters and Character States

Hyphae excluding ascogenous hyphae/ascus

Character location:

1N, haploid mycelium;
NN, dikaryotic mycelium;
2N, diploid mycelium;
XN, mycelium of unknown nuclear status;
MN, multinucleate;
AC, ascocarp -- nonascogenous hyphae (paraphysis and/or excipulum) or ascospore;
AH, ascogenous hypha/ascus;
AS, asexual spore;
BC, basidiocarp;
RS, junction of rhizoid and sporangium;
SC, sporocarp (Endogonales);
SF, sporangiophore;
ZF, zygophore (gametangium and suspensor)

1. Uniperforate septa (excluding ascogenous hyphae/ascus):

0, absent, walled off pore, or apparently walled off pore;
1, a single central pore;

2. Uniperforate septal pore margin (excluding ascogenous hyphae/ascus):

0, uniperforate septal pore absent;
1, unelaborated margin;
2, uniperforate septal pore absent but with some type of discontinuity within the septum, e.g., disruption of central layer of cross wall, wall swelling, and/or deposits within cross wall, suggestive of a blocked or disrupted pore (Ustilaginaceae);
3, septal pore swelling (hymenomycetous type; swells with glutaraldehyde fixation);
4, with lenticular cavity (bifurcate)

3. Protruding non-membrane-bound bodies associated with septal pore(s) (excluding ascogenous hyphae/ascus):

0, absent;
1, present (zygomycetes)

4. Membrane-bound bodies associated with septal pore(s) (excluding ascogenous hyphae/ascus):

0, absent;
1, Woronin bodies (ascomycetes);
2, microbodies (basidiomycetes)

5. Membranous structures associated with septal pore(s) (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, septal pore cap;
- 2, endoplasmic reticulum not associated with plasmodesmata (*Wallemia*);
- 3, endoplasmic reticulum associated with plasmodesmata

6. Non-membrane-bound, electron-dense bodies associated with septal pore(s) (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, present (*Kriegeria* and *Auriculoscypha*)

7. Septal pore occlusion (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, pulley wheel-shaped occlusion (Uredinales type);
- 2, non-membranous [thin non-membranous plate(s) and/or occluding material (Hymenomycetes but may occur elsewhere, e.g., Helvellaceae)];
- 3, membranous plates continuous with plasma membrane (*Tilletia*);
- 4, thickened non-membranous plate (flattened disc, biumbonate, or irregular; Zygomycetes);
- 5, granular lamellate structure (Pezizales);
- 6, subspherical occlusion, non-membrane-bound, starting as translucent finger-like extensions from the pore margin which matures into a multilayered plate surrounded by amorphous material;
- 7, subspherical occlusion, non-membrane-bound, lacking translucent finger-like extensions or plates (*Sclerotinia*)

8. Organelle trafficking (excluding ascogenous hyphae/ascus):

- 0, organelle trafficking absent;
- 1, mitochondria;
- 2, nuclei;
- 3, ribosomes/small particles or organelles

9. Woronin body type (excluding ascogenous hyphae/ascus):

- 0, Woronin bodies absent;
- 1, globose;
- 2, hexagonal;
- 3, rectangular/cylindrical;

10. Septal pore cap basic structure (excluding ascogenous hyphae/ascus):

- 0, pore cap absent;
- 1, elaborated cap with abseptal or adseptal extensions (cupulate, reticulate, or tubular extensions);
- 2, simple cap (cap with unelaborated abseptal surface)

11. Detailed structure of elaborated septal pore cap (excluding ascogenous hyphae/ascus):

- 0, elaborated cap absent;
- 1, abseptal extensions (smooth vesicular-tubular membranous structures);
- 2, multiple saccules;
- 3, cap reticulate

12. Detailed structure of simple septal pore cap (excluding ascogenous hyphae/ascus):

- 0, simple cap absent;
- 1, cap imperforate, flat;
- 2, cap imperforate or uniperforate, curved;
- 3, cap multiperforate, small pores;
- 4, cap multiperforate, large pores

13. Sacculles of elaborated pore cap lined with external electron-dense layer (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, present

14. Substructure of pore cap (excluding ascogenous hyphae/ascus):

- 0, absent
- 1, cap with uniform electron-transparent contents;
- 2, cap with uniform electron-dense contents;
- 3, cap with three internal layers (central electron-dense layer between two less electron-dense layers)

15. Zone of organelle exclusion at pore (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, present

16. Pore cap enclosed by endoplasmic reticulum (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, present, not continuous with pore cap;
- 2, present and continuous with pore cap

Multiperforate septa

17. Multiperforate septum (excluding ascogenous hyphae/ascus):

- 0, multiperforate septum absent;
- 1, simple pores in multiperforate septum with uniform pores **not** solely adjacent to hyphal wall;
- 2, simple pores in multiperforate septum with variable-sized, large pores adjacent to hyphal wall;
- 3, plasmodesmata;
- 4, thickened septum with central pore closed by plasmodesmata

18. Desmotubules in plasmodesmata (excluding ascogenous hyphae/ascus):

- 0, absent;
- 1, present

Basidium/basidiomycete sporocarp

19. Zone of exclusion outside septal pore cap in basidiomycete sporocarp:

- 0, absent;
- 1, zone of exclusion outside (abseptal) pore cap present;

20. Septal pore cap enclosed by endoplasmic reticulum in basidiomycete sporocarp:

- 0, absent;
- 1, present,, not continuous with pore cap;
- 2, present and continuous with pore cap

21. Zone of exclusion in simple septum bordered by microbodies:

- 0, absent;
- 1, present (Uredinales)

22. Primary septum within basidium:

- 0, primary septum within basidium absent;
- 1, without pore (*Myxarium*, *Tulasnella*);
- 2, walled off pore, or apparently walled off pore (*Kriegeria*);
- 3, septal pore with swellings (*Ustilago maydis*, *Auricularia*);
- 4, incomplete septa in basidial apex (*Heterorepetobasidium*)

23. Septal pore cap at primary septum within basidium:

- 0, absent;
- 1, present (*Auricularia*)

Ascogenous hyphae/ascus, immature

24. Immature septal pore, ascogenous hyphae/ascus:

- 0, absent;
- 1, simple with single central pore

25. Immature septal pore associated structures, ascogenous hyphae/ascus:

- 0, pore associated structures absent;
- 1, endoplasmic reticulum associated with toroid occlusion

26. Immature septal pore occlusion, ascogenous hyphae/ascus:

- 0, pore occlusion absent;
- 1, non-membranous [thin non-membranous plate(s) and/or occluding material Helvellaceae];
- 2, toroid occlusion, i.e., donut-like with central pore (Sordaria);
- 3, toroid occlusion containing pulley-wheel-shaped occlusion (Sporormiella);
- 4, occlusion a convex or biconvex band or more complex hemisphere (Pezizales)

27. Immature pore occlusion detailed structure, ascogenous hyphae/ascus:

- 0, pore occlusion absent;
- 1, torus with radiating tubular cisternae (Sordaria);
- 2, torus lacking tubular cisternae (Sporormiella);
- 3, electron-light lamellate torus and granular matrix (aleuriod type);
- 4, hemispherical usually with narrow, electron-opaque inner and broad, electron-light outer bands (ascoboloid type);
- 5, hemispherical with radiating tubular elements (Ascodesmis);
- 6, cone to dumbbell-shaped with V-shaped striations and usually an electron-light torus (helvelloid type);
- 7, double, electron-light-banded torus in granular matrix becoming hemispherical with dense inner zone and less opaque outer zone (otideoid type);
- 8, electron opaque, convex or biconvex bands (pezizoid type);
- 9, electron-opaque, hemispherical with short radiating tubular elements (Pyronema)

Ascogenous hyphae/ascus, mature

28. Mature septal pore, ascogenous hyphae/ascus:

- 0, absent;
- 1, simple with single central pore

29. Mature septal pore associated structures, ascogenous hyphae/ascus:

- 0, pore associated structures absent;
- 1, endoplasmic reticulum associated with toroid occlusion;
- 2, endoplasmic reticulum associated with pore cap membrane

30. Mature septal pore occlusion, ascogenous hyphae/ascus:

- 0, pore occlusion absent;
- 1, toroid occlusion, i.e., donut-like with central pore;
- 2, subspherical pore cap membrane (*Sordaria*);
- 3, occlusion a convex or biconvex band or more complex hemisphere (Pezizales type)

31. Mature pore occlusion detailed structure, ascogenous hyphae/ascus:

- 0, pore occlusion absent;
- 1, torus lacking tubular cisternae (*Sporormia*);
- 2, electron-light lamellate torus and granular matrix (aleuriod type);
- 3, hemispherical usually with narrow, electron-opaque inner and broad, electron-light outer bands (ascoboloid type);
- 4, hemispherical with radiating tubular elements (*Ascodesmis*);
- 5, cone to dumbbell-shaped with V-shaped striations and usually an electron-light torus (helvelloid type);
- 6, double, electron-light-banded torus in granular matrix becoming hemispherical with dense inner zone and less opaque outer zone (otideoid type);
- 7, electron opaque, convex or biconvex bands (pezizoid type);
- 8, electron-opaque, hemispherical with short radiating tubular elements (*Pyronema*);
- 9, simple membrane enclosing cytoplasm (*Sordaria*)
- a, torus with radiating tubular cisternae

Data set phyla

Hyphae excluding ascogenous hyphae/ascus = Ascomycota, Basidiomycota, Chytridiomycota, Zygomycetaceus

Multiperforate septa = Ascomycota, Basidiomycota, Chytridiomycota, Zygomycetaceus

Basidium = Basidiomycota

Ascogenous hyphae/ascus = Ascomycota

Character location to phyla

Ascomycota = 1N, NN, 2N, XN, MN, AC, AH, AS, SF

Basidiomycota = 1N, NN, 2N, XN, MN, AS, BC

Chytridiomycota = 1N, 2N, XN, MN, AS, RS, SF

Zygomycota = 1N, 2N, XN, MN, AS, RS, SC, SF, ZF

Character location to data set

Hyphae excluding ascogenous hyphae/ascus = 1N, NN, 2N, XN, MN, AC, AS, RS, SC, SF, ZF

Multiperforate septa = 1N, NN, 2N, XN, MN, AC, AH, AS, BC, RS, SC, SF, ZF

Basidium = BC

Ascogenous hyphae/ascus = AH