

Tentative key to bryoparasitic Pezizales

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The taxonomy and nomenclature follows Benkert (various publications - see references).

still missing species:

Lamprospora bavarica Benkert
Lamprospora esterlechnerae Benkert
Octospora borealis

unresolved taxa:

Lamprospora feurichiana, L. faroensis, L. kristiansenii

used sources: Benkert (1987a, 1994b, 1995, 1998a, 1998c), Caillet & Moyne (1991), Dennis & Itzerott (1993), Schumacher (1993), for full citations see the references-page.

short key

1	Spores globose or nearly so, ornamented, spore length/width-ratio ≤ 1.1	2
1*	Spores subglobose, ellipsoid or fusiform, ornamented or not, spore length/width ratio > 1.1	39
2	Spore ornamentation consisting solely of warts or tubercles.....	3
2*	Spore ornamentation consisting of ridges, sometimes additionally with warts.....	12
12	Ridges of spore ornamentation $> 2 \mu\text{m}$ wide.....	13
12*	Ridges of spore ornamentation $< 2 \mu\text{m}$ wide.....	16
39	Spores ornamented.....	40
39*	Spores smooth (or ornamentation hardly visible under the light microscope at 1000x magnification).....	69
69	Asci mostly 4-spored.....	70
69*	Asci mostly 8-spored.....	74
74	Spores on average $> 20 \mu\text{m}$ long.....	75
74*	Spores on average $< 20 \mu\text{m}$ long.....	85

full key

1	Spores globose or nearly so, ornamented, spore length/width-ratio ≤ 1.1	2
1*	Spores subglobose, ellipsoid or fusiform, ornamented or not, spore length/width ratio > 1.1	39
2	Spore ornamentation consisting solely of warts or tubercles.....	3
2*	Spores ornamentation consisting of ridges, sometimes additionally with warts.....	12
3	Spores ornamented with large wart or tubercles on average $> 1 \mu\text{m}$ wide.....	4
3*	Spores ornamented with small warts on average $< 1 \mu\text{m}$ wide.....	7
4	Tubercles with many guttules inside.....	Lamprospora maireana

- 4* Tubercles without guttules inside..... 5
- 5 Spores inclusive ornamentation 19-24 μm **Lamprospora rehmi**
- 5* Spores inclusive ornamentation 15-18 μm 6
- 6 Spore ornamentation consisting of warts and tubercles of different sizes up to 3-6 μm wide
..... **Lamprospora tuberculata**
- 6* Spore ornamentation consisting of relatively even sized tubercles 1-3 μm wide
..... **Lamprospora tuberculatella**
- 7 Spores perfectly globose..... 8
- 7* Spores subglobose..... 9
- 8 Warts on spores low, at most as high as wide, on saline soil, host *Hennediella heimii*
..... **Lamprospora lubicensis**
- 8* Warts on spores higher than wide, in wet habitats at arctic/alpine sites, host *Philonotis*
..... **Lamprospora lutziana**
- 9 Apothecia growing in tufts of the epiphyte *Orthotrichum affine*, spores 14-17 x 12-14 μm
..... **Octospora affinis**
- 9* In different habitats..... 10
- 10 In open, warm, sun-exposed habitats, host *Phascum curvicolle*... **Lamprospora ecksteinii**
- 10* In shaded habitats, on pleurocarpous mosses..... 11
- 11 Host *Cratoneuron filicinum*..... **Octospora svrcekii**
- 11* Host *Amblystegium*, mostly *A. serpens*..... **Octospora wrightii**
- 12 Ridges of spore ornamentation > 2 μm wide..... 13
- 12* Ridges of spore ornamentation < 2 μm wide..... 16
- 13 Spore ornamentation consisting of both warts and ridges..... 14
- 13* Spore ornamentation consisting solely of ridges..... 15
- 14 Ridges of spore ornamentation few, often forming one or two complete or incomplete large
circles around the spore circumference..... **Lamprospora annulata**
- 14* Ridges of spore ornamentation interconnected, often forming an irregular reticulum
..... **Lamprospora dicranellae**
- 15 Ridges of spore ornamentation mostly isolated only rarely anastomosing, double walled
..... **Lamprospora moynei**
- 15* Ridges of spore ornamentation connected forming an irregular to almost regular reticulum
..... **Lamprospora arvensis**
- 16 Ridges of spore ornamentation at least partly with blunt ends, not forming a reticulum..... 17
- 16* Ridges of spore ornamentation without blunt ends, forming a reticulum..... 19
- 17 Spores slightly subglobose..... **Lamprospora leptodictya**
- 17* Spores perfectly globose..... 18
- 18 Ridges of spore ornamentation > 1 μm wide..... **Lamprospora ascoboloides**
- 18* Ridges of spore ornamentation < 1 μm wide..... **Lamprospora paechnatzii**
- 19 Spore ornamentation with curved ridges forming an alveolate reticulum (Seaveri-type).... 20
- 19* Spore ornamentation with straight ridges forming an areolate reticulum..... 24

- 20 Spore ornamentation consisting of fine ridges 0.1-0.2 μm wide, parasitic on the liverwort *Aneura pinguis*..... **Lamprospora aneurae**
- 20* Spore ornamentation consisting of broader ridges mostly >0.2 μm wide, parasitic on mosses..... **21**
- 21 With arctic/alpine distribution..... **22**
- 21* Not in arctic/alpine habitats..... **23**
- 22 Ridges of spore ornamentation often > 1 μm wide, often with additional warts between the ridges, host *Tortella tortuosa*..... **Lamprospora cailletii**
- 22* Ridges of spore ornamentation mostly < 1 μm wide, without additional warts, host probably *Pohlia filum*..... **Lamprospora norvegica**
- 23 Ridges of spore ornamentation not more than 1 μm wide, hosts *Bryum* and *Ceratodon*..... **Lamprospora seaveri**
- 23* Broadest ridges of spore ornamentation more than 1 μm wide, hosts *Aloina* and *Trichostomum*..... **Lamprospora hispanica**
- 24 Ridges of spore ornamentation mostly > 0.5 μm high..... **25**
- 24* Ridges of spore ornamentation mostly < 0.5 μm high..... **29**
- 25 Ridges of spore ornamentation mostly 1.5-3 μm high..... **26**
- 25* Ridges of spore ornamentation mostly less than 1.5 μm high..... **27**
- 26 Ridges of spore ornamentation about 0.5 μm wide..... **Lamprospora australis**
- 26* Ridges of spore ornamentation about 1 μm wide..... **Lamprospora areolata**
- 27 Ridges of spore ornamentation 1-1.5 μm wide, host *Campylopus*..... **Lamprospora campylopodis**
- 27* Ridges of spore ornamentation up to 1 μm wide, host *Bryum* or *Ceratodon*..... **28**
- 28 Spores large, 16-19 μm , reticulum with 6-10 meshes per diameter, host probably *Bryum* or *Pohlia*..... **Lamprospora rugensis**
- 28* Spores 13-17 μm , reticulum with 3-6(-8) meshes per diameter, host *Bryum* or *Ceratodon*....
..... **Lamprospora faroensis** Benkert, **Lamprospora feurichiana** (Kirschst.) Benkert,
Lamprospora kristiansenii Benkert *Three very similar and hard to separate species.
The name **Lamprospora retinosa** (Velen.) T. Schumach. is also sometimes adopted to
this species-complex.
- 29 Spores subglobose..... **30**
- 29* Spores perfectly globose..... **32**
- 30 Spore ornamentation of a large-meshed reticulum with 4-7 meshes per diameter
..... **Lamprospora gotlandica**
- 30* Spore ornamentation of a fine-meshed reticulum with 8-20 meshes per diameter..... **31**
- 31 Spores 13-15 x 12-14 μm , host *Funaria hygrometrica*..... **Lamprospora carbonicola**
- 31* Spores 14-16 x 13-15 μm , host *Tortula muralis*..... **Lamprospora dictydiola**
- 32 Spore ornamentation of a fine-meshed reticulum with 8-20 meshes per diameter, only in the arctic..... **Lamprospora spitsbergensis**
- 32* Spore ornamentation of reticulum with 5-10(-12) meshes per diameter..... **33**
- 33 Spores on average more than 16 μm in diameter..... **34**

33*	Spores on average less than 16 μm in diameter.....	35
34	Spores 16-19 μm , ornamentation consisting of ridges 0.5-1(-1.5) μm wide, host <i>Syntrichia</i>	Lamprospora tortulae-ruralis
34*	Spores 16-17 μm , ornamentation consisting of ridges about 0.5 μm wide, host <i>Ditrichum flexicaule</i>	Lamprospora ditrichi
35	Apothecia with inconspicuous margin, host <i>Dicranella cerviculata</i>	Lamprospora hanffii
35*	Apothecia with prominent membranaceous margin, host different.....	36
36	Spore ornamentation consisting of often non-continuous ridges, host <i>Bryum</i> or <i>Leptobryum</i>	Lamprospora minuta
36*	Spore ornamentation consisting of continuous ridges (rarely non-continuous), parasitic on mosses of the Pottiaceae family.....	37 (Lamprospora miniata-complex)
37	Spores (12-)13-15 μm , host <i>Barbula unguiculata</i>	Lamprospora miniata var. parvispora
37*	Spores 14-16 μm , host different.....	38
38	Ridges of spore ornamentation 0.5-1 μm wide, host <i>Didymodon</i>	Lamprospora miniata var. ratisbonensis
38*	Ridges of spore ornamentation about 0.5 μm wide, host different.....	Lamprospora miniata var. miniata
39	Spores ornamented.....	40
39*	Spores smooth (or ornamentation hardly visible under the light microscope at 1000x magnification).....	69
40	Spore ornamentation consisting of ridges forming a \pm reticulate pattern, rarely with isolated ridges not forming an reticulate pattern (<i>L. leptodictya</i>).....	41
40*	Spore ornamentation consisting of isolated warts.....	48
41	Ridges of spore ornamentation at least partly with blunt ends, not forming a reticulum, spores 15-17 x 13-15.5 μm	Lamprospora leptodictya
41*	Spore ornamentation \pm reticulate.....	42
42	Underside of apothecia with hairs.....	43
42*	Apothecia without hairs.....	45
43	Spore ornamentation hardly visible without staining, spores 19-24 x 10-12 μm , in arctic regions.....	Neottiella aphanodictyon
43*	Spore ornamentation conspicuous, clearly visible even without staining, Spores mostly \geq 12 μm wide.....	44
44	Host <i>Atrichum undulatum</i> , apothecia growing sometimes directly on the Moss, spores 19-23(-24) x (11-)12-14 μm	Neottiella albocincta
44*	Host <i>Polytrichum</i> spec. (mostly <i>Polytrichum juniperinum</i>), apothecia always growing on soil, spores (18)20-26(30) x (11)12-15 μm	Neottiella rutilans
45	Spores on average > 12 μm wide.....	46
45*	Spores on average < 12 μm wide.....	47
46	Spores 17-21 x 14-16(-17) μm with 8-12 meshes/diameter.....	Lamprospora retispora
46*	Spores 15-17 x 12-15 μm with 4-6 meshes/diameter.....	Lamprospora gotlandica
47	Spores 16-19 x 11-12 μm , host <i>Syntrichia</i>	Octospora neerlandica

- 47* Spores 14-16 x 10-11 μm , host *Didymodon*.....**Octospora canariensis**
- 48 Asci mostly 4-spored (immature asci may be 8-spored in case of *O. phagospora*).....**49**
- 48* Asci 8-spored..... **50**
- 49 Ascospores 10-11(-12) μm wide, apothecia on soil in shaded habitats (mostly forests), temperate species.....**Octospora phagospora**
- 49* Ascospores (8-)8.5-10(-11) μm wide, apothecia in cushions of *Tetraplodon*, in arctic/alpine habitats..... **Octospora alpestris**
- 50 Spores > 22 μm long, ellipsoid, narrowly ellipsoid or fusiform.....**51**
- 50* Spores \leq 22 μm long, subglobose, broadly ellipsoid or ellipsoid..... **54**
- 51 Outside of apothecia with thick-walled hairs, spores with isolated, rounded warts**52**
- 51* Apothecia without hairs, spores densely ornamented with fine, conical warts.....**53**
- 52 Spores 22-27 x 13-15 μm , apothecia large, 3-20 mm in diameter, host *Polytrichum***Neottiella vivida**
- 52* Spores 21-26 x 10-12.5 μm , apothecia 0.5-1 mm in diameter, host unknown, possibly *Pohlia*..... **Octospora megalopolitana**
- 53 Ascospores (20-)22-26 x 10-12 μm**Octospora bridei**
- 53* Ascospores 31-45 x 9-11(12) μm**Octospora echinospora**
- 54 Margin of apothecia first whitish, becoming blackish with age, hosts are mosses of the family Grimmiaceae..... **55**
- 54* Margin of apothecia not becoming blackish with age, host different..... **56**
- 55 Ascospores (16-)18-21(-22) x 10-13(-14) μm , host *Grimmia pulvinata*. **Octospora meslinii**
- 55* Ascospores 19-22 x 13-15(-16) μm , host *Schistidium*.....**Octospora pseudoampezzana**
- 56 Spores ellipsoid, spore length/width ratio > 1.3.....**57**
- 56* Spores subglobose to broadly ellipsoid, spore length/width-ratio < 1.3..... **60**
- 57 Growing epiphytic on the bark of trees and shrubs, rarely on stone, host *Orthotrichum*..... **Octospora orthotricha**
- 57* Growing on soil or thalli of liverworts, host different..... **58**
- 58 Host *Marchantia polymorpha*, apothecia growing directly on the thallus of the host or on the nearby soil.....**Octospora ithacaensis**
- 58* Parasitic on mosses..... **59**
- 59 Spores 17-21 x 9-11 μm , host *Fissidens bryoides*.....**Octospora fissidentis**
- 59* Spores 16-18 x 11-13 μm , host *Bryum*.....**Octospora similis**
- 60 Host *Orthotrichum affine*, spores 14-17 x 12-14 μm**Octospora affinis**
- 60* Host different..... **61**
- 61 Spores on average > 16 μm long..... **62**
- 61* Spores on average < 16 μm long..... **64**
- 62 Spores 18-22 x 16-19 μm , growing on liverworts, only known from South-America**Octospora cashii**
- 62* Spores smaller, parasitic to mosses..... **63**

- 63 Warts of spore ornamentation low, to 0.5 μm high, often comma-shaped, host *Bryum*
..... **Octospora heterosculpturata**
- 63* Warts of spore ornamentation 0.5-1 μm high and wide, never comma-shaped, host
Schwetschkeopsis, only known from North-America..... **Octospora texensis**
- 64 Spore ornamentation consisting of isolated, often conical warts of different sizes, small
warts 0.5-1 μm wide and high, hosts *Cryphaea* and *Forstroemia*..... **Octospora americana**
- 64* Spore ornamentation consisting of more or less even sized, rounded warts..... **65**
- 65 Spores on average < 11 μm wide, host *Splachnum*..... **Octospora splachnophila**
- 65* Spores on average > 11 μm wide, host different..... **66**
- 66 Host *Pseudoleskeella nervosa*, spores 13-15 x 11-13 μm **Octospora erzbergeri**
- 66* Host different..... **67**
- 67 Host *Amblystegium*, spores 12-14 x 11-13 μm **Octospora wrightii**
- 67* Host different..... **68**
- 68 Host *Hygrohypnum luridum*, spores 13-14 x 11-12 μm **Octospora hygrohypnophila**
- 68* Host unknown, possibly *Pohlia*, spores 14-16 x 12-14 μm **Octospora moravecii**
- 69 Asci mostly 4-spored..... **70**
- 69* Asci mostly 8-spored..... **74**
- 70 Spores on average > 27 μm long..... **71**
- 70* Spores on average < 27 μm long..... **72**
- 71 Spores 26-32 x 10-12 μm , mostly with one central and two lateral droplets, host *Phascum*
cuspidatum..... **Octospora axillaris var. tetraspora**
- 71* Spores 27-34 x 9-11 μm , mostly with two large droplets in the centre and two smaller ones
at the ends, host *Bryum*..... **Octospora coccinea var. tetraspora**
- 72 Spores on average < 11 μm wide, host *Bryum* but not *Bryum argenteum*.....
..... **Octospora gemmicola var. tetraspora**
- 72* Spores on average > 11 μm wide, host different..... **73**
- 73 Apothecia often with a membranaceous margin, host *Bryum argenteum*.....
..... **Octospora leucoloma var. tetraspora**
- 73* Apothecia without a membranaceous margin, host *Pterygoneurum*..... **Octospora itzerottii**
- 74 Spores on average > 20 μm long..... **75**
- 74* Spores on average < 20 μm long..... **85**
- 75 Apothecia growing on rocks, stones or walls in cushions of *Grimmia*, in tufts of *Schistidium*
or *Tortella*..... **76**
- 75* Apothecia growing in other habitats..... **79**
- 76 Spores uniseriate within the ascus, ellipsoid to slightly fusiform, on average \geq 12 μm wide
..... **77**
- 76* Spores at least partly biseriate within the ascus, ellipsoid to short cylindrical, almost
parallel-sides in the middle, on average < 12 μm wide..... **78**
- 77 Spores ellipsoid, 20-24 x 12-14 μm , with one large droplet, apothecia growing in cushions
of *Grimmia pulvinata*..... **Octospora grimmiae**

- 77* Spores ellipsoid to slightly fusiform, 20-22.5 x 11.5-13 µm, with two large droplets, apothecia growing in tufts of *Tortella tortuosa*.....**Octospora guestfaliensis**
- 78 Apothecia growing in cushions of *Grimmia pulvinata*, spores 21-28(-30) x (9-)10-11(-12) µm.....**Octospora musci-muralis**
- 78* Apothecia growing in tufts of *Schistidium*, spores 19-25 x 9-11 µm,.....**Octospora musci-muralis var. neglecta**
- 79 Spores uniseriate within the ascus (sometimes both uniseriate and biseriate asci present - *O. axillaris*)..... **80**
- 79* Spores biseriate at least in the upper part of the ascus..... **83**
- 80 Spores 19-27 x 13-17 µm.....**Octospora excipulata**
- 80* Spores on average < 13 µm wide..... **81**
- 81 Apothecia large, 2-10 mm in diameter, on sandy soil in open, base-poor habitats, host mosses of the family Polytrichaceae, mostly *Polytrichum piliferum*..... **Octospora humosa**
- 81* Apothecia small, 0.5-3 mm in diameter, host different..... **82**
- 82 Spores 21-26 x 10-11 µm, mostly with two large droplets, narrowly ellipsoid to slightly fusiform at one or both ends, host *Phascum cuspidatum*.....**Octospora axillaris**
- 82 Spores 17-22 x 9-13 µm, mostly with one large droplet, hosts are mosses of the family Pottiaceae or rarely *Bryum*.....**Octospora gyalectoides**
- 83 Spores narrowly ellipsoid to narrowly fusiform, 24-30 x 8-10 µm, mostly with four droplets two larger ones in the middle and two smaller ones near the ends.....**Octospora coccinea**
- 83* Spores ellipsoid, on average < 24 µm long..... **84**
- 84 Spores 19-23 x 8.5-10.5 µm, host *Bryum* but not *Bryum argenteum* **Octospora gemmicola**
- 84* Spores 20-24 x 10-12 µm, host *Bryum argenteum*.....**Octospora leucoloma**
- 85 Spores on average > 17 µm long..... **86**
- 85* Spores on average ≤ 17 µm long..... **87**
- 86 Spores 17-22 x 9-13 µm, hosts are mosses of the family Pottiaceae or rarely *Bryum*.....**Octospora gyalectoides**
- 86* Spores 18-20 x 8.5-10.5 µm, host *Fissidens bryoides*.....**Octospora nemoralis**
- 87 Spores subglobose, 15-18 x 14-15 µm, host *Bryum pseudotriquetrum*.....**Octospora subglobispora**
- 87* Spores ellipsoid, on average < 14 µm wide, host different..... **88**
- 88 Outside of apothecia with stiff hairs..... **Octospora hetieri**
- 88* Apothecia without hairs..... **89**
- 89 Host *Ceratodon purpureus*..... **90**
- 89* Host different..... **91**
- 90 Apothecia tomato-red to salmon-red, with conspicuous membranaceous margin, paraphyses somewhat constricted at cross walls..... **Octospora rubens**
- 90* Apothecia pale-orange to orange, without membranaceous margin, paraphyses not constricted at cross walls..... **Octospora rustica**
- 91 Apothecia lilac or pinkish, accompanying mosses *Dicranella*, *Pleuridium*, *Ditrichum*..... **Octospora lilacina**

91* Apothecia orange, host *Bryum argenteum*.....**Octospora bryi-argentei**