

THE GENUS *PYRENOPEZIZA* FUEKEL IN BELGIUM KEY TO THE SPECIES.

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Abb.: max./min. = maximum/minimum; CRB = cresylblue 0.3-1 %, IKI = jodkaliumjodide, MLZ = Melzer's reagent; KOH = potassiumhydroxide 1-5%; LB = lipid body (oily guttule); LC = lipid content of the spores: 0 = without lipid content, 5 = maximal possible lipid content, VB = vacuolar body.

Provisionary names are put in "..." and refer to new species.

Used marks:

- = present in Belgium
- = present in Belgium and available in the herbarium of the author
- (●) = non Belgian collection(s) available in the herbarium of the author

Pyrenopeziza Fuckel

Syn.: *Cylindrosporium* Grev., *Hysteropeziza* Rabenh., anam. *Cadophora* Lagerb. & Merlin, *Mycochaetophora* Hara & Ogawa, *Rhexocercosporidium* U. Braun.

Type species: *Pyrenopeziza chailletii* (Pers.) Fuckel.

Lit.: Hein & Scheuer 1985: 133 (sub *Hysteropeziza*), Baral (unpublished key), Declercq (unpublished key).

1	On wood of deciduous trees	2
1'	On leaves of deciduous trees	4
1"	On herbaceous stems or petioles	11
1'''	On monocotyls	46

Lignicolous species

2	Spores 7-9(11)x2-2.5 µm, 0(1)-septate, OCI 0-1; asci 40-60x5.5-7.5 µm, IKI-, without croziers; marginal protrudings hyaline; saprobic on branch of <i>Cornus</i> ; phen.: VI	● "Mollisia" cf. myricariae Rehm Ill.: Rehm 1896: fig.: 506.	3
2'	Asci IKI bb		
3	Apothecia 0.2-0.3 mm diam.; asci 50-60x5 µm, IKI bb, ?with croziers; spores 12-15x2.5 µm, 1-septate, OCI ?1; saprobic on corticated branch of <i>Salix caprea</i> ; phen.: V	Pyrenopeziza salicis (Feltgen) Nannf. (1932)	
3'	Apothecia 0.25-0.45 mm diam.; asci 35-43x5.5-6.5 µm, IKI bb, without croziers; spores 4.5-9.2x1.8-2.2 µm, OCI 1; saprobic on decorticated branch of <i>Ulex europaeus</i> ; phen.: II	● Pyrenopeziza "deuncinata" Baral nom. prov.	
3"	Apothecia 0.5-0.8 mm diam., bluish grey; asci 40-50x6-7 µm, IKI+, with croziers, with "Psilachnum drop" beyond the spore part; spores 4-6x2 µm, OCI 1-2; on wood (<i>Castanea</i>); phen.: XII-V(IX) (DE, GB).....	○ Pyrenopeziza aquosa (Berk. & Broome) Baral (2020) Ill.: Ellis & Ellis 1985: fig. 28.	

Foliicolous species

4	Apothecia cupulate, 0.2-0.25 mm diam.; ectal excipulum pale ochraceous with reddish brown incrustated tufts; spores clavate, 7-9x2-2.5 µm, OCI 0; asci 45-60 µm long; marginal protrudings hyaline and up to 40 µm long; saprobic on leaves of <i>Rubus</i> ; phen.: V-VI	● Pyrenopeziza maculata Graddon (1986)	
4'	Apothecia becoming scutellate, larger		5
5	Ectal excipulum almost hyaline; spores cylindrical, 10-15x2.5-3 µm, OCI=0; saprobic on leaves on <i>Betula</i> ; phen.: VI-VIII	● Pyrenopeziza betulicola Fuckel (1870) [1869-70] Ill.: Hein 1976: Abb.37.	
5'	Ectal excipulum greyish brown		6
6	Spores 11.5-18x3.2-4 µm, aseptate, OCI 4; asci 57-88x9 µm, IKI bb, with croziers; saprobic on leaves of <i>Betula</i> ; phen.: IV-V	Pyrenopeziza betulina (Alb. & Schwein.) Rauschert (1988) Ill.: Alb. & Schwein. 1805: Tab. VII 5.	
6'	Spores OCI 0-1		7
7	Asci up to 70 µm long		8
7'	Asci up to 50 µm long		9

- 8 Apothecia immersed and elongate when young; spores 6.5-11.5x2-2.5 µm, OCI 0; asci (40)60-70 µm long; marginal protrudings unicellular, up to 30 µm long; saprobic on petioles of *Acer*, seldomly on petioles of other trees (*Alnus*, *Fraxinus*, *Tilia*); phen.: (III)IV-VII (X) • **Pyrenopeziza petiolaris** (Alb. & Schw.) Nannf. (1932)
- 8' Asci 55-60x7-8 µm, IKI bb, with croziers; spores 9-13x2.2-3 µm, OCI 0; marginal protrudings up to 60 µm long; saprobic on leaves of *Salix caprea* and *Salix reticulata*; phen.: IV-VI **"Microscypha" monticola** Svrček (1976)
- 9 Spores clavate, 6.5-9x2-2.2 µm, OCI 0; asci 35-50 µm long; marginal protrudings up to 60 µm long; saprobic on leaves of *Alnus glutinosa*; phen.: V-VI • **Pyrenopeziza foliicola** (P. Karst.) Sacc. (1877)
- 9' Apothecia up to 0.4 mm diam. Spores 8-10(12)x2-2.5(3) µm, OCI 0; asci 35-60x9 µm long; marginal protrudings up to 20 µm long; saprobic on leaves of *Salix caprea*; phen.: V • **Pyrenopeziza fuckelii** Nannf. (1931)
Ill.: Rubio & al. 2010: p. 258.

Caulicolous species

- 11 Asci without croziers 12
- 11' Asci with croziers 13
- 12 Apothecia 0.2-0.4 mm diam., hymenium pale gray, with white margin; asci 35-60x6-8 µm, IKI bb, without croziers; spores 8-10x1.9-2.35 µm, OCI 2.5; saprobic on stems of *Geum urbarum*; phen.: V **Pyrenopeziza "geum"** Baral nom. prov.
- 12' Apothecia 0.5-1 mm diam.; asci 52-68x6-7 µm, IKI BB, without croziers; spores 12-13.5x2.5-3.5 µm, 1-septate, OCI 2; with up to 100 µm long lateral hyphal protrudings; saprobic on stems of *Ranunculus mollis*, *Ranunculus repens*; phen.: V-VI **Pyrenopeziza ranunculi** (Graddon) Baral comb. nov. ined.
- 13 Marginal protrudings average longer than 50 (60) µm 14
- 13' Marginal protrudings in average shorter or almost absent 17
- 14 Spores 17-21x2 µm, OCI 0-2; asci 80 µm long; marginal protrudings up to 80 µm long (*Mercurialis*); phen.: IV **Pyrenopeziza mercurialisidis** Graddon (1986)
- 14' Lipid content 3-4.5 15
- 15 Ectal excipulum almost hyaline; spores 11-15(18)x2-2.5 µm, 0(1)septate, with several small guttules, OCI 3; asci 55-80 µm long, with croziers; marginal protrudings hyaline and up to 90 µm long (*Rubus fruticosus*, *Rubus idaeus*); phen.: V • **Pyrenopeziza cookei** Baral (2020)
- 15' Ectal excipulum not so 16
- 16 Spores 0(1.3)-septate, 18-32x3.5-4(6) µm, OCI 4.5; asci 55-100 µm long; marginal protrudings 40-90 µm long (*Thalictrum*). Phen.: IV-VII • **Pyrenopeziza thalictri** (Peck) Sacc. (1889)
- 16' Spores clavate, with easily loosening episporus, 0(1)septate, 9-12x2.5-3 µm, with two medium polar guttules and a few small ones, OCI 3, forming subglobose ascoconidia; asci 45-55 µm long; marginal protrudings 40-90 µm long (*Rubus fruticosus*, *Rubus idaeus*, *Rosa*); phen.: (IV)V-IX • **Pyrenopeziza rubi** (Fr.) Rehm (1878)
- 17 Spores septate 18
- 17' Spores predominantly aseptate 20
- 18 Spores 3-septate 19
- 18' Spores 1-septate, 12-27x2-3 µm, OCI ?; asci 45-60 µm long; marginal protrudings up to 50 µm long (*Artemisia vulgaris*); phen.: VI **Pyrenopeziza leucostoma** (P. Karst.) Nannf. (1932)
- 19 Spores 29-42x3-3.5 µm, OCI 0-1; asci 80-100 µm long; marginal protrudings up to 30 µm long (*Arctium*); phen.: IV-VI • **Pyrenopeziza arctii** (W. Phillips ex Buchnall) Nannf. (1932)
- 19' Spores clavate, 20-35x3-4 µm, OCI 3; asci (60)75-90 µm long; marginal protrudings up to 20 µm long; saprobic on stems of *Euphrasia*, *Odontitis serotina*, *Rhinanthus*; phen.: V **Pyrenopeziza euphrasiae** (Fuckel) J. Kunze (1892) [1896]
- 20 Apothecia cupulate 21
- 20' Apothecia scutellate 23
- 21 Spores 13.5-22x3.5-4 µm, OCI 4; paraphyses and marginal protrudings covered by gel; saprobic on *Filipendula ulmaria*; phen.: (IV)V-VI(XI) • **Pyrenopeziza millegrana** Boud. (1907)
- 21' Spores OCI 0-1.5 22

22 Spores 6-11.5x2-2.5 µm, OCI 1.5; asci 25-55 µm long, IKI bb, with croziers; marginal protrudings up to 50 µm long ; saprobic on stems of <i>Cirsium</i> , <i>Epilobium</i> , <i>Eupatorium</i> , but mainly on <i>Filipendula ulmaria</i> ; phen.: (I)IV-VII(XI)	
.....	• Pyrenopeziza pulveracea (Fuckel) Hütter (1958)
22' Spores clavate, 7-9x2-2.5 µm, OCI 0; apothecia 0.25 mm diam., outer surface dark brown striate; asci 45-60 µm long; marginal protrudings up to 40 µm long; saprobic on stems of <i>Rubus</i> ; phen.: V-VI	
.....	• Pyrenopeziza maculata Graddon (1986)
	Compare <i>P. escharodes</i>
23 Spores longer than 15 µm	24
23' Spores shorter	28
24 Asci longer than 60 µm	25
24' Asci shorter	27
25 Apothecia with grey hymenium and whitish margin; asci 60-85x8-9 µm; spores 11-19x2-3.5 µm, OCI 2.5-3.5; with marginal protrudings (<i>Heracleum</i> , <i>Polygonatum</i>); phen.: IV-V	
.....	○ Pyrenopeziza chailletii (Pers.) Fuckel (1870) [1869-70]
	Ill.: Rubio & al. 2010: p. 256.
25' Spores in average more than 20 µm long	26
26 Apothecia 0.5-1.2 mm diam., hymenium grey, margin white; asci 82-90x9.5-12 µm, IKI bb; spores 20-23x3-4 µm, OCI 3; with marginal protrudings; saprobic on petioles of <i>Petasites</i> , stems of <i>Chaerophyllum aureum</i> ; phen.: V-VI ..	
.....	Pyrenopeziza baraliana Gminder (2006)
26' Spores fusiform-clavate, 15-26x2.5-3 µm, OCI 3; asci 55-75x5-6 µm, becoming 1-3-septate; with short marginal protrudings (<i>Arctium</i> , <i>Cirsium</i>); phen.: II-V (IX-X) (BE/V, BE/W)	• Pyrenopeziza inornata Graddon (1972)
	Ill.: Graddon 1972: fig. 7.
27 Spores 15-24x2-3 µm, OCI 3; asci 40-65 µm long; marginal protrudings up to 20 µm long; saprobic on stems of <i>Galium boreale</i> , <i>G. verum</i> , <i>G. mollugo</i> ; phen.: V-VII	Pyrenopeziza galii-veri (P. Karst.) Sacc. (1889)
	Ill.: Raitviir & Leenurm 2001: fig. 19-20.
27' Spores 15-20x2-3 µm, 0(1)-septate, OCI 2-4; asci *45-75x8-9 µm; with conspicuous marginal protrudings; saprobic on stems of <i>Artemisia vulgaris</i> , <i>Cirsium arvense</i> , <i>Cirsium palustre</i> and <i>Eupatorium cannabinum</i> ; phen.: (III)IV-VI(IX)	• Pyrenopeziza carduorum Rehm (1872)
28 Spores 6-9(12)x1.5-2(3) µm, with polar guttules, OCI 2-3; asci 30-50x6-8 µm; ectal excipulum reddish brown with up to 20 µm long marginal protrudings (<i>Polygonum</i> , <i>Rumex</i>); phen.: (IV)V-XI	• Pyrenopeziza polygoni (Lasch) Gremmen (1958)
28' Ectal excipulum greyish brown to blackish brown	30
30 Spores minimum 3 µm wide	31
30' Spores less than 3 µm wide	34
31 Spore OCI 2-3	32
31' Spore OCI ?	33
32 Apothecia up to 0.5 mm diam.; spores 0(1)-septate, 11-15x3-3.5 µm, OCI 2; asci 45-55 µm long; marginal protrudings up to 30 µm long (<i>Lotus</i> , <i>Ononis</i> , <i>Trifolium</i>); phen.: V-VII Pyrenopeziza compressula Rehm (1892) [1896]	
32' Spores 10-17(21)x2.5-3(4) µm, with two polar guttules and several small ones, OCI 3, rarely 1-septate; asci 45-50x7-8 µm, 4- or 8-spored, I+ or IKI-, with croziers (Rubio & al. 2010: asci IKI b, spores 11.8-16.8x3.2-4.1 µm); saprobic on leaves of <i>Plantago lanceolata</i> ; phen.: III-V, VIII-IX • Pyrenopeziza plantaginis Fuckel (1870) [1869-70]	
	Ill.: Rubio & al. 2010: p. 262.
33 Spores 7-15x3-3.5 µm, OCI 0; asci 40-50 µm long; marginal protrudings up to 30 µm long; saprobic on stems of <i>Aconitum</i> , <i>Laserpitium</i> , <i>Oenanthe</i> , <i>Peucedanum</i> , <i>Veratrum</i> ; phen.: V-VIII	Pyrenopeziza subplicata Rehm (1892) [1896]
33' Spores 11.5-13.5x3.5 µm, OCI ?; asci up to 50 µm long; marginal protrudings up to 20 µm long; saprobic on stems of <i>Solidago</i> ; phen.: ?	Pyrenopeziza solidaginis (P. Karst.) Schröter (1893) [1908]
34 Spores (7)10-15 µm long	35
34' Spores up to 10 µm long	39
35 Spore OCI 2-3	36
35' Spore OCI 0-1(1.5)	37

- 36 Spores 0(1)septate, 9.5-14x2-2.5 µm, with several small guttules at each end, OCI 3; asci 35-65x7-8 µm, IKI bb, without croziers; paraphyses sublanceolate; marginal protrudings up to 50 µm long; saprobic on stems of *Mercurialis*; phen.: IV-VI • **Pyrenopeziza mercurialis** (Fuckel) Boud. (1907)
 Ill.: Rubio & al. 2010: p. 260.
- 36' Apothecia up to 3 mm diam.; spores 10.5-13x2-2.5 µm, with two polar guttules, OCI 2; asci 75-115 µm long; marginal protrudings ?; saprobic on stems of *Leucopus europaeus*; phen.: IV
 • **Pyrenopeziza lycopincola** (Rehm) Boud.(1907)
- 37 Spores 0(1)septate, 11-15(18)x2-2.5 µm, OCI 1; asci 35-65 µm long; marginal protrudings up to 25 µm long; saprobic on leaves of *Iris pseudacorus*; phen.: IV-V(VII) • **Pyrenopeziza inapiculata** Declercq (2002)
- 37' Spores shorter 38
- 38 Apothecia erumpent, up to 0.7x0.5 mm, almost black when dry, with inconspicuous marginal protrudings; spores 8-12x2 µm, OCI ?0; saprobic on stems of *Angelica sylvestris*, especially around the nodes; phen.: V-XI
 • **Pyrenopeziza plicata** (Rehm) Rehm (1892)
 Ill.: Ellis & Ellis 1985: fig. 1352.
- 38' Apothecia up to 0.8 mm diam.; spores clavate, 9-12.5x2-2.5 µm, OCI 1; asci up to 60 µm long; marginal protrudings 40-50 µm long (*Arctium*, *Cirsium*); phen.: IV-IX • **Pyrenopeziza depressuloides** (Gremmen) Gremmen (1958)
 Ill.: Gremmen 1955, pl. II G.
- 39 Marginal protrudings 40-60 µm long 40
- 39' Marginal protrudings shorter 42
- 40 Spores 6-9x1.5-2 µm, OCI 0-1; asci 40-60 µm long; marginal protrudings up to 60 µm long (*Urtica dioica*, *Lamium galeobdolon*??); phen.: IV-VII(IX) • **Pyrenopeziza urticicola** (W. Phillips) Boud. (1907)
- 40' Spores larger 41
- 41 Spores 6-10.5x2-2.5 µm, OCI 0-1.5; asci 30-65x5-6 µm; apothecia 0.3-1 mm diam., outer surface striate, hymenium ochraceous; marginal protrudings 40-60 µm long (*Angelica*, *Arctium*, *Artemisia*, *Centaurea*, *Chamerion*, *Cirsium*, *Galeopsis*, *Heracleum*, *Impatiens*, *Rubus*, *Symphytum*); phen.: IV-VII(VIII-XII)
 • **Pyrenopeziza escharodes** (Berk. & Br.) Rehm (1892) [1896]
- 41' Spores 8-13(23)x2-2.5(3) µm, OCI 1; asci 8-spored, 50-70 µm long, mostly not all spores becoming mature; marginal protrudings up to 50 µm long (*Sambucus ebulus*); phen.: V-VII ... • **Pyrenopeziza ebulli** (Fr.) Sacc. (1889)
- 42 Spores 8-10x1.5-2 µm, OCI 3, asci 50-65x5 µm; marginal protrudings up to 20 µm long (*Artemisia vulgaris*); phen.: IV-V(IX). ○ **Pyrenopeziza artemisiae** (Lasch) Rehm (1871)
- 42' Spores OCI 0-2 43
- 43 Apothecia 0.5-1.2 mm diam.; asci 50-64x6.5-7.5 µm, IKI bb or sometimes IKI-, with croziers; spores 4.5-6x2.5-3 µm, verruculose, biguttulate; saprobic on corticated branches of *Ulex europaeus*; phen.: II-III
 • **Pyrenopeziza "ulicis"** Baral nom. prov.
- 43' Spores smooth 44
- 44 Spores 6-11x2-2.5 µm; asci 30-40 µm long; marginal protrudings up to 40 µm long; saprobic on stems of *Gentiana asclepiadea*; phen.: VIII • **Pyrenopeziza gentianae-asclepiadeae** Nannf. (1932)
 Ill. : Schmid I. & H. 1990 : nr. 11.
- 44' Spores 7.9-10.2x1.8-2.4 µm, OCI 1; asci 55x6 µm, IKI bb, with croziers; saprobic on stems of *Asparagus*, *Angelica sylvestris*, *Arctium lappa*, *Cirsium arvense*; phen.: IV-V • **Pyrenopeziza atrata** (Pers.) Fuckel (1870)
- 44" Spores up to 2 µm wide..... 45
- 45 Spores 6-8x1.5-2 µm, OCI 1; asci 25-50 µm long; marginal protrudings up to 30 µm long; saprobic on stems of *Digitalis purpurea*; phen.: V-VII(X) • **Pyrenopeziza digitalina** (W. Phillips) Sacc. (1889)
 Ill.: Rubio & al. 2010: p. 257.
- 45' Spores 6.5-10(12.5)x1.7-2 µm, OCI 0-1; asci 25-45x4-4.5 µm, IKI+, with croziers; marginal protrudings up to 30 µm long; saprobic on stems of *Cirsium palustre*, *Chamerion angustifolium*, *Epilobium hirsutum*, *Symphytum officinale*; phen.: V-IX(X) • **Pyrenopeziza chamaenerii** Nannf. (1928)

Species on monocotyls

- 46 Ectal excipulum hyaline 47
- 46' Ectal excipulum pigmented 48

- 47 Apothecia 0,09-0.15 mm diam., almost hyaline, pale orange to slightly brownish when dry, margin without conspicuous hairlike protrudings; asci 25-30x5-6 µm, J+; spores 7-9x1.5-2 µm, aseptate, hyaline; saprobic on leaves of *Carex brizoides*; phen.: V **Pyrenopeziza perminuta** Scheuer (1999)
- 47' Ectal excipulum with cylindrical to clavate protrudings up to 30 µm long; asci 45-58x5-7 µm, IKI bb, with croziers; spores 7-11x2-2.2 µm, OCI 1 (*Glyceria maxima*); phen.: V • **Pyrenopeziza sp. 2**
- 48 Apothecia up to 0.7 mm diam., brownish, margin with up to 70 µm long protrudings sticking together to form teeth; asci 45-55x6-6.5 µm, J+; spores 10-11x2.5-3 µm, aseptate, hyaline; saprobic on leaves of *Carex panicea*; phen.: VIII **Pyrenopeziza pubescens** (Hein & Scheuer) Scheuer (1999)
- 48' Apothecia without teathed margin 49
- 49 Asci IKI+, with croziers; spores 6.8-9.3x2.3-2.7 µm; on *Typha*; phen.: VI **Pyrenopeziza typhicola**
- 49' Spores longer 50
- 50 Apothecia 0.1-0.3 mm diam., urceolate, hymenium pale grey; ectal excipulum covered by red-brown granular exudate; asci 40-60x5-7 µm, IKI bb/(r)b, with croziers; spores 8-15x2.5-3 µm, 0(1)-septate, OCI 3; saprobic on grasses (*Brachypodium*, *Calamagrostis*, *Deschampsia*, *Phalaris*, *Poa*), *Carex*, *Scirpus*; phen.: VI-VIII • **Pyrenopeziza karstenii** Sacc. (1889)
 Ill.: Rubio & al. 2010: p. 259.
- 50' Asci 70-80x12 µm; spores clavate, 0(1)-septate, 17-18x3-3.5 µm, saprobic on leaves of *Carex*, *Eriophorum*; phen.: VI-VIII **Pyrenopeziza fuscescens** (Rehm) Défago (1968) [1967]
 Ill.: Spooner 1981: fig. 30.
 syn.: ?*Mollisia upsaliensis* Svrček

Lacking characteristics:

- saprobic on stems of *Laserpitium latifolium*; phen.: VI **Pyrenopeziza nannfeldtii** Petr., *Ann. Mycol.* **38**: 368 (1940)
- saprobic on inflorescences of *Sibbaldia procumbens*; phen.: VIII
 **Pyrenopeziza potentillae** (Rostr.) Nannf., *Sv. Bot. Tidskr.* **22**: 136 (1928)
- saprobic on stems of *Knautia arvensis*; phen.: VI
 **Pyrenopeziza scabiosicola** (Petr.) Hütter, *Phytopath. Zeitschr.* **33**: 30 (1958)