

DICHOTOMOUS KEY – *Peltigera*

Modified from Goward et al. 1995, Goward 1994, Goffinet and Hastings 1994, Vitikainen 1994, Vitikainen 111, and Hollinger 2011 (<http://alumnus.caltech.edu/~hollin/pictures/peltigera/key.html>). More species will be formally described/split from existing species. The inescapable reality is this is an incredibly difficult genus and this key is an imperfect work in progress.

- 1a. Aquatic; resembling a large *Leptogium* when wet, but with colourless discrete veins on the underside; rare, found in cool mountain streams in the west ***Peltigera gowardii*** 2
- 1b. Terrestrial 2
- 2a. Two photobionts present: primary photobiont green (*Coccomyxa*); secondary photobiont blue-green (*Nostoc*), confined to cephalodia, these scattered over the upper or lower surface **Green *Peltigera* – Lead 6**
- 2b. One photobiont present: blue-green (*Nostoc*); cephalodia absent 3
- 3a. Soredia present **Sorediate Blue-green *Peltigera* – Lead 12**
- 3b. Soredia absent 4
- 4a. Laminal isidia or laminal lobules present **Isidiate Blue-green *Peltigera* – Lead 18**
- 4b. Laminal isidia/lobules absent (vegetative propagules may be present along margins, laminal stress cracks or laminal scars) 5
- 5a. Upper cortex tomentose (arachnoid or erect – check sheltered lobe tips carefully) **Dog *Peltigera* – Lead 19**
- 5b. Upper cortex scabrid or pruinose but not tomentose **Non-tomentose *Peltigera* – Lead 30**

Green *Peltigera* (note that *P. leucophlebia*, *britannica* and *aphthosa* may have small maculate lobes with pure blue-green photobiont growing attached to them)

- 6a. Cephalodia hidden, on lower surface; thallus fan-shaped, attached to the substrate at a single point along the margin, averaging <2 cm in diameter; apothecia disc-shaped along margins ***P. venosa***
- 6b. Cephalodia present over the upper surface; thallus more or less lobate, broadly attached, averaging >3 cm in diameter; apothecia saddle/finger-nail shaped 7
- 7a. Lower surface darkening abruptly toward thallus centre; veins broad to indistinct, poorly developed 8
- 8a. Mature cephalodia peltate [dorsiventrally flattened, scale-like and detachable] (check sheltered lobes), usually flat or concave, often detaching and leaving white scars; humid localities at lower elevations ***P. britannica***
- 8b. Mature cephalodia appressed throughout, usually convex or flat, adnate [not detaching]; widespread ..9
- 9a. Lobe margins wavy and thin; backs of apothecia with patchy cortex ***P. 'conspersa'* TGO**
- 9b. Lobe margins even with thick "silver lining" [white line visible from above in wet specimen due to the evenly exposed lower edge]; backs of apothecia with continuous cortex ***P. aphthosa***
- 7b. Lower surface darkening gradually toward thallus centre, veins distinct and well-delineated 10
- 10a. Tomentum on upper surface restricted to lobe edges 11
- 11a. Lower surfaces of apothecia continuously corticate; lobes few; lobe margins even or weakly crisped; cephalodia in central portions of thallus up to 2 mm in diameter; restricted to snowy districts, usually at higher elevations (but also along the coast) ***P. chionophila***
- 11b. Lower surfaces of apothecia patchy-corticate to noncorticate; lobes many; lobe margins strongly crisped; cephalodia seldom > 1 mm in diameter, widespread ***P. leucophlebia***
- 10b. Lobes tomentose from lobe edge to centre of thallus, veins foveolate (wide with relatively deep depressions); rare ***P. latiloba***

Sorediate BG *Peltigera* (largely modified from Goffinet et al. 2003 – if something doesn't fit, go back to original key to revisit the three species I removed from the modified key)

- 12a. Soredia primarily marginal; apothecial disk black, on short extensions of vegetative lobes ***P. collina***
- 12b. Soredia entirely laminal; when present, apothecial disk usually brownish, on rather elongate extensions of the vegetative lobes 13

- 13a.** Upper surface glabrous throughout, dull; soralia mostly in rounded patches on surface, situated towards thallus centre but not marginal; usually lacking secondary substances..... *P. didactyla* (young sterile form)
- 13b.** Upper surface tomentous along margins, dull or shiny; rhizines not forming a dense mat..... **14**
- 14a.** Apothecia or apothecial initials present..... **15**
- 15a.** Apothecia common, located at the tips of upright lobes; usually lacking secondary substances..... *P. didactyla*
- 15b.** Apothecia rare, located along lobe margins; soralia containing gyrophoric acid and methyl gyrophorate (KCPink flash) *P. extenuata*
- 14b.** Apothecia or apothecial initials absent..... **16**
- 16a.** Lobes monophyllous, soon strongly concave and pouch-like; outermost rhizines tapered to a point; mostly on soil or thin moss *P. didactyla*
- 16b.** Lobes usually polyphyllous, weakly to strongly concave, but not usually pouch-like; outermost rhizines flaring and/or flocculent; mostly on thick moss..... **17**
- 17a.** Upper surface smooth, more or less shiny, castaneous brown; lower surface darkening towards thallus centre; rhizines often tufted, hedgerow-forming toward lobe tips; pycnidia frequent along lobe margins *P. castanea*
- 17b.** Upper surface minutely roughened, dull, dove-grey to purplish brown; lower surface mostly pale; rhizines more or less flocculent throughout; pycnidia rare..... *P. extenuata*

Isidiate BG Peltigera (excludes species where regenerative lobules are restricted to stress cracks, margins or scars)

- 18a.** Isidia dorsiventral and more or less appressed [flattened and scale-like]; mature lobes < 0.8 cm wide; lobe tips upturned; usually over soil..... *P. lepidophora*
- 18b.** Isidia cylindrical or rarely dorsiventral, predominantly erect; mature lobes > 1 cm wide; lobe tips often downturned; over moss in sheltered sites..... *P. evansiana*

Dog Peltigera (tomentum either erect or arachnoid [look carefully before concluding absent])

- 19a.** Upper surface dark greenish when wet, bearing erect, felt-like tomentum, especially near lobe tips; lower surface lacking veins, or with few and indistinct veins; medulla thick, thallus like cardboard in texture *P. malacea*
- 19b.** Upper surface bluish or greyish when wet, bearing appressed or erect tomentum near the lobe tips; lower surface distinctly veined; medulla thin or thick **20**
- 20a.** Veins low, very dark brown toward thallus centre, strikingly contrastive with the interstices; upper surface in part scabrid, bearing erect tomentum near the lobe tips; lobe tips mostly downturned *P. kristinssonii*
- 20b.** Thallus not fitting all criteria above; generally bearing some appressed arachnoid tomentum..... **21**
- 21a.** Lobes < 1.5 cm wide at maturity; lobe tips mostly upturned **22**
- 22a.** Mature apothecia averaging 3-4 (-6)mm long; most lobes fertile, soralial scars often present on sterile portion of thallus *P. didactyla*
- 22b.** Mature apothecia >4-8(-12)mm long; thallus often entirely sterile; no soralial scars..... **23**
- 23a.** Rhizines becoming confluent toward thallus centre; veins rather felt-like but not tomentose, uniformly (and often abruptly) darkening toward thallus centre, mostly forming a netlike pattern; upper tomentum usually extending towards middle of lobes, with pruina crusting central portions as well..... *P. rufescens*
- 23b.** Rhizines mostly discrete; veins with a compact appearance, pale throughout or more often irregularly darkening toward thallus centre **24**
- 24a.** Lobe margins often sparsely lobulate (check mature lobes); upper surface often somewhat broadly billowed; veins distinct, pale at margins; rhizines short and simple, pale at margins and darkening towards centre *P. wulingensis*
- 24b.** Lobe margin and stress cracks lacking lobules; upper surface plane or at least not broadly billowed; rhizines and veins usually pale throughout, veins often appearing overlapping *P. ponojensis*
- 21b.** Lobes >1.5 cm wide at maturity; lobe tips mostly downturned or plane..... **25**
- 25a.** Rhizines discrete, not mat-forming, but usually with erect tomentum (appearing squarrosely branched and tips may flare)..... **26**

- 26a.** Veins broad, strongly raised, apparently overlapping, broader than interstices, often tomentose; interstices deeply pitted, mostly lenticular [lens-shaped or oval]; rhizines stout with squarrose branching and/or tomentum; primarily boreal *P. retifoveata*
- 26b.** Veins narrower than interstices, generally fusing; interstices not deeply pitted **27**
- 27a.** Interstices broad, polygonal & diamond-shaped; lobe margins and margins of stress crack lacking lobules; veins strongly raised and sharply defined, usually pale but sometimes grading to dark brown towards thallus centre *P. membranacea*
- 27b.** Interstices lenticular; veins raised to flat, may be tomentose near lobe margins; lobe margins more or less crisped and wavy; lobe margins and margins of stress cracks usually lobulate (check mature lobes) *P. praetextata*
- 25b.** Rhizines discrete to mat-forming, lacking tomentum (not appearing squarrose) **28**
- 28a.** Rhizines richly penicillate or flocculent, usually confluent [mat-forming] toward thallus centre (but may be simple immediately near lobe margins); upper surface appressed-tomentose more or less throughout; veins usually lacking erect tomentum, darkening centrally *P. canina*
- 28b.** Rhizines generally simple and discrete throughout (except flaring toward the tips in some specimens); upper surface usually abruptly glabrous toward thallus centre **29**
- 29a.** Veins lacking tomentum and distinctly rusty cinnamon-coloured toward thallus centre; lobe margins more or less even; lobe margins and margins of stress cracks lacking lobules *P. cinnamomea*
- 29b.** Veins pale to dark brown, but not distinctly cinnamon-coloured; lobe margins more or less crisped; lobe margins and margins of stress cracks usually lobulate (check mature lobes); interstices mostly lenticular; veins raised or more often rather low *P. praetextata*

Non-tomentose *Peltigera*

- 30a.** Upper surface conspicuously scabrid (at least toward lobe tip), never pruinose **31**
- 31a.** Veins dark toward thallus centre, strikingly contrastive with the interstices; upper surface apparently glabrous but actually bearing minute erect tomentum near lobe tips (check sheltered lobes) *P. kristinssonii*
- 31b.** Veins dark or pale, not strikingly contrastive with the interstices; upper surface glabrous throughout; rhizines fasciculate, proportionally short; upper surface distinctly and uniformly scabrid; lower surface dark toward thallus centre; rhizines dark throughout *P. scabrosa*
- 30b.** Upper surface smooth and occasionally pruinose near lobe tip **32**
- 32a.** Apothecial disk distinctly black **33**
- 33a.** Upper surface shiny; veins usually broad, indistinct; outermost rhizines most often dark; typically over (mossy) ground or on tree bases; common *P. neckeri*
- 33b.** Upper surface usually dull; veins narrow, distinct (check fertile lobes); outermost rhizines most often pale; typically over (mossy) trees; rare epiphyte in Alberta *P. collina*
- 32b.** Apothecial disk brownish, or apothecia absent **34**
- 34a.** Lobe margins and (or) margins of stress cracks lobulate **35**
- 35a.** Veins low, abruptly darkening toward thallus centre in most specimens, interstices absent or sparse, oval **36**
- 36a.** Outermost rhizines generally aligned in one or more concentric rows *P. elisabethae*
- 36b.** Outermost rhizines unaligned *P. hymenina*
- 35b.** Veins raised, darkening only gradually (if at all) toward thallus centre; interstices mostly numerous, lenticular; marginal lobules poorly developed, hardly recognizable as such; rhizines darkening only gradually toward thallus centre; margin downturned *P. degenii*
- 34b.** Lobe margins and margins of stress cracks crisped in some specimens but rarely lobulate **37**
- 37a.** Outermost rhizines fasciculate, generally aligned in one or more concentric rows; mature apothecia horizontally oriented, the disc more or less plane **38**
- 38a.** Upper surface typically with numerous stress cracks; veins dark brown to almost black, indistinct or apparently absent; interstices sparse; common *P. elisabethae*

- 38b.** Upper surface typically lacking stress cracks; veins medium brown, broad to occasionally indistinct; interstices more or less numerous; absent in Alberta?... *P. horizontalis*
- 37b.** Outermost rhizines simple, penicillate or flocculent, not aligned in concentric rows; mature apothecia vertically oriented, the disc vertically folded **39**
- 39a.** Veins narrow, more or less distinctly raised; upper surface distinctly shiny; lobe tips downturned; veins not apparently overlapping; rare in wet sites *P. degenii*
- 39b.** Veins broad, low, not overlapping; veins and rhizines never erect-tomentose **40**
- 40a.** Veins very dark toward thallus centre, strikingly contrastive with the interstices; upper surface apparently glabrous, but actually bearing erect tomentum near lobe tips (check sheltered lobes; mountains and foothills *P. kristinssonii*
- 40b.** Veins pale or dark, not strikingly contrastive with interstices; upper surface glabrous throughout; distribution various **41**
- 41a.** Stress cracks frequent; lobes thick (>0.4mm) **42**
- 42a.** Thallus steel grey when wet; veins abruptly darkening toward centre; apothecia black; upper surface often pruinose *P. neckeri*
- 42a.** Thallus emerald green when wet; rhizines dark (at least outermost), proportionally short, either fasciculate or poorly developed; upper surface in part minutely corrugate; apothecia red-brown; in bogs...*P. occidentalis*
- 41b.** Stress cracks sparse, lobes thin (<0.4mm) **43**
- 43a.** Lobe margins lobulate or at least very strongly crisped; mature lobes < 10(-15)mm wide; upper surface plane or wrinkled but never billowed; usually with abundant apothecia *P. polydactylon*
- 48b.** Lobe margins neither lobulate nor strongly crisped; mature lobes >20 mm wide, and thin (<0.04mm); upper surface plane or somewhat broadly billowed, usually lacking pruina; rhizines long; when fertile, multiple apothecia per lobe..... *P. neopolydactyla s.lat.*