

Supplementary material

Appendix 1. Crustose lichens restricted to wood in the Pacific Northwest (PNW) and Fennoscandia (FS), and types of dead wood they colonize. – denotes species not reported since their description. Life forms: C = calicioid; CR = crust; M = macrolichen. Order: IS = placement uncertain (*incertae sedis*). Rep. mode: reproductive mode S = sexual, AS = asexual by soredia, AI = asexual by isidia. Substrate affinity: * obligately lignicolous in region specified; ** facultatively lignicolous, also known to occur on bark or other substrates; *** not known to occur on wood in the region specified. Ang/Con: occurs on A = angiosperms or C = conifers. Microsite type: AW = anthropogenic wood; BR = decorticated branches; BS = beaver scars; BW = burnt wood; FD = freshwater driftwood; L = logs; MD = maritime driftwood; SC = dead wood scars on living trees; SN = snags; ST = stumps. Inclusion on Red Lists: FI = Finland; MT = Montana; NO = Norway; NW = Northwest Forest Plan (USDA 2001); OR, Oregon; SE, Sweden. nd = no data available.

Life form	Species	Order	Rep. mode	Substrate affinity		Ang/Con	Microsite type	Red List	Selected references
				FS	PNW				
CR	<i>Absconditella celata</i> Döbbele & Poelt	Ostropales	S	***	*	C	L		3, 10, 13
CR	<i>Absconditella delutula</i> (Nyl.) Coppins & H.Kilias	Ostropales	S	*	-	C	L	SE	3, 10, 34
CR	<i>Absconditella lignicola</i> Vězda & Pišut	Ostropales	S	*	*	A, C	L, SN, ST		3, 10, 13
CR	<i>Absconditella trivialis</i> (Willey ex Tuck.) Vězda	Ostropales	S	***	*	nd	nd		3, 10, 11
CR	<i>Acarospora anomala</i> H.Magn.	Acarosporales	S	*	-	C	AW	SE	3, 10, 33, 34
CR	<i>Arthonia spadicea</i> (Nyl.) Zahlbr.	Arthoniales	S	**	*	C	SN		3, 10, 12
CR	<i>Bacidia subcircumspecta</i> Coppins	Lecanorales	S	*	-	C	AW		14
CR	<i>Biatora globulosa</i> (Flörke) Fr.	Lecanorales	S	**	*	C	SN		3, 44
CR	<i>Biatora ligni-mollis</i> T.Sprib. & Printzen	Lecanorales	S	-	*	C	SN		13
CR	<i>Biatora troedelagica</i> Holien & Printzen +	Lecanorales	AS	*	-	C	L		30
C	<i>Brucea castoris</i> Rikkinen	IS	S	-	*	C	BS		8
CR	<i>Buellia arborea</i> Coppins & Tønsberg	Teloschistales	AS	*	*	C	AW, BR, L		12, 20, 42
CR	<i>Buellia chloroleuca</i> Körb.	Teloschistales	S	***	*	C	L		2, 3, 10, 12
C	<i>Calicium abietinum</i> Pers.	Teloschistales	S	*	*	A, C	AW, L, SN, ST	FI, NO, NW, OR, SE	7, 34, 37
C	<i>Calicium denigratum</i> (Vain.) Tibell	Teloschistales	S	*	-	C	SN, ST		37
C	<i>Calicium trabinellum</i> Ach.	Teloschistales	S	*	*	A, C	SN, ST		4, 37
CR	<i>Caloplaca furfuracea</i> H.Magn.	Teloschistales	AI	*	***	C	AW	SE	3, 10
CR	<i>Caloplaca tromsoeënsis</i> H.Magn.	Teloschistales	S	*	-	A	nd		3, 10
CR	<i>Catillaria erysiboides</i> (Nyl.) Th.Fr.	Lecanorales	S	*	*	A, C	FD, L, SC, ST		3, 10, 12, 29
CR	<i>Catinaria neuschildii</i> (Körb.) P.James	Lecanorales	S	**	*	C	SN		3, 10
C	<i>Chaenotheca brunneola</i> (Ach.) Müll.Arg.	IS	S	*	*	C	L, SN, ST		4, 37
C	<i>Chaenotheca gracilentia</i> (Ach.) J.Mattson & Middelb.	IS	S	**	*	C	SN, ST	FI, NO, SE	4, 34, 37
C	<i>Chaenotheca gracillima</i> (Vain.) Tibell	IS	S	**	*	C	SN, ST	NO, SE	4, 34, 37
C	<i>Chaenotheca hygrophila</i> Tibell	IS	S	*	**	C	ST	NO	37
C	<i>Chaenotheca nitidula</i> Tibell	IS	S	-	*	C	SN		7, 38
C	<i>Chaenotheca xyloxena</i> Nádv.	IS	S	*	*	A, C	L, SN, ST		4, 7, 37
C	<i>Chaenothecopsis debilis</i> (Sm.) Tibell	Mycocaliciales	S	**	*	A, C	SN, ST		4, 7, 37
C	<i>Chaenothecopsis fennica</i> (Laurila) Tibell	Mycocaliciales	S	*	-	C	SN, ST		37

C	<i>Chaenothecopsis nigra</i> Tibell	Mycocaliciales	S	**	*	C	SN		12, 37
C	<i>Chaenothecopsis nigripunctata</i> Rikkinen	Mycocaliciales	S	-	*	C	BW		4, 7, 9
C	<i>Chaenothecopsis pusiola</i> (Ach.) Vainio	Mycocaliciales	S	**	*	C	nd		4, 7, 37
C	<i>Chaenothecopsis viridireagens</i> (Nád.v.) A.F.W. Schmidt	Mycocaliciales	S	**	*	C	SN		4, 37
M	<i>Cladonia bacilliformis</i> (Nyl.) Glüick	Lecanorales	AS	*	*	C	AW, L, ST		4, 22
M	<i>Cladonia botrytes</i> (K.G.Hagen) Willd.	Lecanorales	S	*	*	C	AW, L, ST	MT	4, 22
M	<i>Cladonia macilenta</i> Hoffm.	Lecanorales	AS	**	*	C	L, ST		4, 22
M	<i>Cladonia parasitica</i> (Hoffm.) Hoffm.	Lecanorales	S	*	*	A, C	BR, L, ST	FI, NO, SE	22, 34
M	<i>Cladonia umbricola</i> Tønsberg & Ahti	Lecanorales	AS	*	**	C	ST		22
C	<i>Cyphelium notarisii</i> (Tul.) Blomb. & Forssell	Lecanorales	S	*	**	C	AW	FI, SE	34, 37
C	<i>Cyphelium pinicola</i> Tibell	Lecanorales	S	*	*	A, C	BR, SC	FI, NO, SE	34, 37
C	<i>Cyphelium tigillare</i> (Ach.) Ach.	Lecanorales	S	*	**	C	AW, BR, SN, ST	FI, SE	37
C	<i>Cyphelium trachylioides</i> (Nyl. ex Branth & Rostr.) Erichsen	Lecanorales	S	*	*	A, C	AW, BR	SE	1, 34, 37
CR	<i>Elixia flexella</i> (Ach.) Lumbsch	*Lecanoromycetidae, IS	S	*	*	C	ST	SE	3, 10, 12
CR	<i>Gyalideopsis helvetica</i> van den Boom & Vězda	Ostropales	AS	*	*	C	L		12, 21
CR	<i>Hafellia fosteri</i> Imsh. & Sheard	Teloschistales	S	-	*	prob C	MD		31
CR	<i>Hertelidea botryosa</i> (Fr.) Kantvilas & Printzen	Lecanorales	AS	*	**	C	BW, L, ST		3, 10
CR	<i>Hypocnomyce anthracophila</i> (Nyl.) P.James & Gotth.Schneid.	*Lecanoromycetidae, IS	AS	*	*	C	BW, SN, ST	NO	3, 10, 12, 39
CR	<i>Hypocnomyce castaneocinerea</i> (Räsänen) Timdal	*Lecanoromycetidae, IS	AS	*	*	C	BW, SN, ST	NO	5, 39
CR	<i>Hypocnomyce friesii</i> (Ach.) P.James in P.James & Gotth.Schneid.	*Lecanoromycetidae, IS	S	*	**	C	BW, SN, ST		3, 10, 39
CR	<i>Hypocnomyce oligospora</i> Timdal	*Lecanoromycetidae, IS	S	-	*	C	BW, SN, ST		40, 44
CR	<i>Lecanora anoapta</i> Nyl.	Lecanorales	S	*	-	C	AW, SN, ST		3, 10
CR	<i>Lecanora apochroeoides</i> Vain. +	Lecanorales	S	*	-	C	SN		6, 10
CR	<i>Lecanora cadubrioides</i> ined.	Lecanorales	S	-	*	C	BR, L, ST		26
CR	<i>Lecanora detrusa</i> (Th.Fr.) Vain.	Lecanorales	S	*	-	A, C	L, ST		10
CR	<i>Lecanora dovrensis</i> Hedl. +	Lecanorales	S	*	-	nd	nd		10
CR	<i>Lecanora hypopta</i> auct., non (Ach.) Vain.	Lecanorales	S	*	**	C	BR, L, SC, SN, ST		3, 10
CR	<i>Lecanora mughicola</i> Nyl.	Lecanorales	S	*	*	C	SN		10, 32
CR	<i>Lecanora orae-frigidae</i> R.Sant.	Lecanorales	AS	*	*	C	AW, MD		3, 10, 17
CR	<i>Lecanora paroptoides</i> Nyl.	Lecanorales	S	*	-	nd	nd		10
CR	<i>Lecanora pseudohypopta</i> Vain. +	Lecanorales	S	*	-	nd	nd		10
CR	<i>Lecanora saligna</i> (Schrad.) Zahlbr.	Lecanorales	S	*	*	A, C	AW, L, ST		10, 32
CR	<i>Lecanora sarcopidoides</i> (A.Massal.) A.L.Sm.	Lecanorales	S	*	-	C	AW		10
CR	<i>Lecanora scanica</i> H.Magn.	Lecanorales	S	*	-	A	L, SC	SE	10
CR	<i>Lecanora subintricata</i> (Nyl.) Th.Fr.	Lecanorales	S	**	*	C	BR, L, ST		32
CR	<i>Lecanora xylophila</i> Hue	Lecanorales	S	-	*	nd	MD		11
CR	<i>Lecidea apochroeella</i> Nyl.	Lecanorales	S	*	-	C	nd		3, 10
CR	<i>Lecidea consimilis</i> Nyl. +	Lecanorales	S	*	-	nd	nd		10
CR	<i>Lecidea dalearlica</i> Hedl. +	Lecanorales	S	*	-	C	AW		3, 10
CR	<i>Lecidea enclitica</i> Nyl.	Lecanorales	S	*	-	nd	nd		3, 10
CR	<i>Lecidea exsequens</i> Nyl. (including <i>L. gibberosa</i>)	Lecanorales	S	*	-	A, C	L, SN, ST		3, 28
CR	<i>Lecidea huxariensis</i> (Beckh. ex J.Lahm) Zahlbr.	Lecanorales	S	*	-	C	AW		3, 10
CR	<i>Lecidea paraclitica</i> Nyl.	Lecanorales	S	*	-	C	AW		3, 10
CR	<i>Lecidea pullula</i> (Tuck.) Zahlbr.	Lecanorales	S	-	*	prob C	nd		11
CR	" <i>Lecidea</i> " <i>scabridula</i> Hedl., nom illeg.	Baeomycetales	S	*	*	C	L		10, 12, 28
CR	<i>Lecidea subhumida</i> Vain. +	Lecanorales	S	*	-	nd	nd		28
CR	<i>Lecidea subinsequens</i> Nyl.	Lecanorales	S	*	-	nd	nd		28
CR	<i>Lecidea symmictella</i> Nyl.	Lecanorales	S	*	*	C	L, ST		3, 10, 12

CR	<i>Lecidea turgidula</i> Fr.	Lecanorales	S	**	*	C	SN		32
CR	<i>Lecidella pulveracea</i> (Flörke ex Schaer.) Sydow	Lecanorales	S	*	-	C	AW		3, 10
CR	<i>Lecidella xylophila</i> (Th.Fr.) Knoph & Leuckert	Lecanorales	S	*	-	C	BR		3, 10
M	<i>Letharia vulpina</i> (L.) Hue	Lecanorales	AS	*	**	C	AW, BR, SN, ST	FI, NO, SE	34
CR	<i>Lignoscripta atroalba</i> B.D.Ryan & T.H.Nash	Baeomycetales	S	-	*	C	AW, BR		12
CR	<i>Micarea alabastrites</i> (Nyl.) Coppins	Lecanorales	S	***	*	A	SN, ST		41
CR	<i>Micarea anterior</i> (Nyl.) Hedl.	Lecanorales	S	*	-	C	L, ST		3, 10, 18
CR	<i>Micarea contexta</i> Hedl.	Lecanorales	S	*	-	C	L, ST		3, 10, 18
CR	<i>Micarea denigrata</i> (Fr.) Hedl.	Lecanorales	S	*	**	A, C	AW, BR, L, SN, ST		3, 10
CR	<i>Micarea elachista</i> (Körb.) Coppins & R.Sant.	Lecanorales	S	*	-	C	L, SN, ST		3, 10
CR	<i>Micarea eximia</i> Hedl.	Lecanorales	S	*	-	C	L, SN, ST		3, 10, 18
CR	<i>Micarea hedlundii</i> Coppins	Lecanorales	AS	*	**	C	ST	NO, SE	3, 10, 19, 44
CR	<i>Micarea melaena</i> (Nyl.) Hedl.	Lecanorales	S	**	*	C	L, SN, ST		12, 18
CR	<i>Micarea melaeniza</i> Hedl. +	Lecanorales	S	*	-	C	nd	SE	18
CR	<i>Micarea misella</i> (Nyl.) Hedl.	Lecanorales	S	*	**	C	L, SN, ST		3, 10, 18
CR	<i>Micarea nigella</i> Coppins	Lecanorales	S	*	-	C	L		3, 10, 18
CR	<i>Micarea rhabdogena</i> (Norman) Hedl.	Lecanorales	S	*	-	C	L		3, 10, 18
CR	<i>Micarea tomentosa</i> Czarnota & Coppins	Lecanorales	AS	*	-	C	ST		19, 35
C	<i>Microcalicium ahlneri</i> Tibell	IS	S	*	*	C	SN, ST	NO	4, 7, 37
C	<i>Microcalicium conversum</i> Tibell	IS	S	-	*	A	SN?		27
M	<i>Multiclavula mucida</i> (Pers.) R.H.Petersen	Agaricales	S	*	-	A	L		10
C	<i>Mycocalicium albonigrum</i> (Nyl.) Tibell	Mycocaliciales	S	-	*	nd	nd		7
C	<i>Mycocalicium subtile</i> (Pers.) Szatala	Mycocaliciales	S	*	*	A, C	BR, SC, SN		4, 7, 37
C	<i>Mycocalicium victoriae</i> (C.Knight ex F.Wilson) Tibell	Mycocaliciales	S	-	*	C	nd		7
CR	<i>Opegrapha protuberans</i> Zahlbr.	Arthoniales	S	-	*	C	nd		32, 44
CR	<i>Opegrapha subparallela</i> Müll.Arg.	Arthoniales	S	*	-	nd	nd		10
CR	<i>Ophioparma rubricosa</i> (Müll.Arg.) S.Ekman	*Lecanoro- mycetidae, IS	S	-	*	C	L, SN		11, 32, 44
CR	<i>Protoparmelia hypotremella</i> van Hierk, Spier & V.Wirth	Lecanorales	AI	*	*	C	AW, BR?		3, 10, 44
CR	<i>Protoparmelia oleagina</i> (Harm.) Coppins	Lecanorales	AI	*	-	C	AW, BR		3, 10
CR	<i>Protothelenella xyliina</i> H.Mayrhofer & Poelt	IS	S	*	-	nd	ST		10, 24
CR	<i>Ptychographa xylographoides</i> Nyl.	Baeomycetales	S	-	*	C	L		25, 32
CR	<i>Pycnora praestabilis</i> (Vain.) Hafellner	Lecanorales	S	*	*	C	AW, SN	NO	3, 10, 12, 39
CR	<i>Pycnora sorophora</i> (Vain.) Hafellner	Lecanorales	AS	*	**	C	AW, BR, SN		3, 10, 44
CR	<i>Pycnora xanthococca</i> (Sommerf.) Hafellner	Lecanorales	S	*	**	C	AW, BR, L, SN		3, 10, 12, 39, 44
CR	<i>Ramboldia elabens</i> (Fr.) Kantvilas & Elix	Lecanorales	S	*	-	C	AW, BR, L, SN, ST		3, 10
CR	<i>Ramboldia insidiosa</i> (Fr.) Hafellner	Lecanorales	S	*	-	C	AW		3, 10
CR	<i>Rinodina malangica</i> (Norman) Arnold	Lecanorales	AS	*	-	A	nd		23
C	<i>Sclerophora amabilis</i> (Tibell) Tibell	IS	S	*	**	A	SC	NO, SE	34, 37
C	<i>Sphinctrina anglica</i> Nyl.	Mycocaliciales	S	*	-	C	AW	SE	16, 34, 37
CR	<i>Thelidium xyloiderma</i> Norman +	Verrucariales	S	*	-	nd	nd		10
CR	<i>Thelocarpon depresselum</i> Vain.	IS	S	*	-	C	L		3, 10
CR	<i>Thelocarpon superellum</i> Nyl.	IS	S	*	-	C	L		3, 10
C	<i>Thelomma occidentale</i> (Herre) Tibell	Teloschistales	S	-	*	nd	AW		36
C	<i>Thelomma ocellatum</i> (Körb.) Tibell	Teloschistales	AI	*	*	C	AW, ST		36, 37
CR	<i>Trapeliopsis glaucolepidea</i> (Nyl.) Gotth.Schneid.	Baeomycetales	AS	*	-	C	L, ST		3, 10
CR	<i>Trapeliopsis viridescens</i> (Schrad.) Coppins & P.James	Baeomycetales	AS	*	**	C	ST	SE	3, 10
CR	<i>Verrucaria carbonella</i> Nyl. ex Hulting	Verrucariales	S	*	-	nd	BW		10
CR	<i>Verrucaria litorea</i> (Hepp) Zschacke	Verrucariales	S	*	-	A	L		3, 10
CR	<i>Verrucaria trabalis</i> Nyl. +	Verrucariales	S	*	-	nd	FD		15

CR	<i>Xylographa corrugans</i> Norman	Baeomycetales	AS	*	*	C	L	32, 43
CR	<i>Xylographa hians</i> Tuck.	Baeomycetales	S	-	*	A,C	L	11, 32
CR	<i>Xylographa opegraphella</i> Nyl. ex Rothr.	Baeomycetales	S	*	*	C	AW, MD	3, 10, 32
CR	<i>Xylographa parallela</i> (Ach.: Fr.) Fr.	Baeomycetales	S	*	*	A,C	BR, L, SN, ST	3, 10, 11, 32, 44
CR	<i>Xylographa trunciseda</i> (Th.Fr.) Minks ex Redinger	Baeomycetales	S	*	*	C	BR, L, SN, ST	2, 3, 10, 12
CR	<i>Xylographa vitiligo</i> (Ach.) J.R.Laundon	Baeomycetales	AS	*	*	C	L, MD, SN, ST	3, 10, 11, 32
CR	<i>Xyloschistes platytropa</i> (Nyl.) Vain.	Ostropales	S	*	*	C	BR, SN, ST	10, 12

Sources cited in References

1: Arup (1999); 2: Bunnell et al. (2008); 3: Foucard (2001); 4: Goward (1999); 5: Goward et al. (1994); 6: Räsänen (1927); 7: Rikkinen (2003a); 8: Rikkinen (2003b); 9: Rikkinen (2003c); 10: Santesson et al. (2004); 11: Spribille (2006); 12: Spribille and Björk (2008); 13: Spribille et al. (2008); 14: Svensson (2007).

Other sources

- 15: Breuss, O. 1998. Drei neue holz- und borkenbewohnende *Verrucaria*-Arten mit einem Schlüssel der bisher bekannten Taxa. – *Linzer Biol. Beiträge* 30: 831–836.
- 16: Brodo, I. M. and Aptroot, A. 2005. Corticolous species of *Protoparmelia* (lichenized Ascomycotina) in North America. – *Can. J. Bot.* 83: 1075–1081.
- 17: Brodo, I. M. and Vänškä, H. 1984. Notes on the maritime, lignicolous lichen *Lecanora orae-frigidae*. – *Lichenologist* 16: 45–51.
- 18: Coppins, B. J. 1983. A taxonomic study of the lichen genus *Micarea* in Europe. – *Bull. Brit. Mus. (Natural History), Bot. Ser.* 11: 17–214.
- 19: Czarnota, P. 2007. The lichen genus *Micarea* (Lecanorales, Ascomycota) in Poland. – *Polish Bot. Studies* 23: 1–199.
- 20: Foucard, T. and Nordin, A. 1999. *Buellia arborea*, an overlooked sorediate lichen on wood in Sweden. – *Graphis Scripta* 10: 53–58.
- 21: Hermansson, J. et al. 2008. Hotade och sällsynta växter i Dalarna, del 2 – lavar och mossor. – *Dalarnas Botaniska Sällskap*.
- 22: Krog, H. et al. 1994. Lavflora. Norske busk- och bladlav. – Universitetsforlaget AS, Oslo.
- 23: Mayrhofer, H. and Moberg, R. 2002. *Rinodina*. – In: Ahti, T. et al. (eds), *Nordic lichen flora. Vol. 2. Physciaceae*. Nordic Lichen Society, pp. 41–69.
- 24: Mayrhofer, H. and Poelt, J. 1985. Die Flechtengattung *Microglaena* sensu Zahlbruckner in Europa. – *Herzogia* 7: 13–79.
- 25: McCune, B. 1997. *Ptychographa*, a lichen genus new to North America. – *Bryologist* 100: 239–240.
- 26: Pérez-Ortega, S. et al. 2008. A molecular phylogeny of the *Lecanora varia* group, with two new species from western North America. – Unpubl.
- 27: Peterson, E. B. and Rikkinen, J. 1999. Range extensions of selected pin-lichens and allied fungi in the Pacific Northwest. – *Bryologist* 102: 370–376.
- 28: Printzen, C. 1995. Die Flechtengattung *Biatora* in Europa. – *Bibl. Lich.* 60: 1–275.
- 29: Printzen, C. and Tønsberg, T. 1999. The lichen genus *Biatora* in northwestern North America. – *Bryologist* 102: 692–713.
- 30: Printzen, C. et al. 1998. Two new *Biatora* species from western Norway and Madeira. – *Lichenologist* 30: 213–219.
- 31: Sheard, J. W. 1992. The lichenized ascomycete genus *Hafellia* in North America. – *Bryologist* 95: 79–87.
- 32: Spribille, T. Unpubl. herbarium data.
- 33: Thor, G. 1996. The biology and distribution of three red listed lichens in Sweden. – *Symb. Bot. Upsal.* 31: 355–363.
- 34: Thor, G. and Arvidsson, L. (eds) 1999. Rödlistade lavar i Sverige – Artfakta [Swedish Red Data Book of lichens 1999]. – *ArtDatabanken, SLU, Uppsala*.
- 35: Thor, G. and Svensson, M. 2008. *Micarea tomentosa* new to Sweden. – *Graphis Scripta* 20: 28–30.
- 36: Tibell, L. 1976. The genus *Thelomma*. – *Bot. Not.* 129: 221–249.
- 37: Tibell, L. 2002. Caliciales. – *Nordic Lichen Flora* 1: 20–71.
- 38: Tibell, L. and Koffman, A. 2002. *Chaenotheca nitidula*, a new species of calicioid lichen from northeastern North America. – *Bryologist* 105: 353–357.
- 39: Timdal, E. 1984. The genus *Hypocenomyce* (Lecanorales, Lecideaceae), with special emphasis on Norwegian and Swedish species. – *Nord. J. Bot.* 4: 83–108.
- 40: Timdal, E. 2001. *Hypocenomyce oligospora* and *H. sierrae*, two new lichen species. – *Mycotaxon* 77: 445–453.
- 41: Tønsberg, T. and Coppins, B.J. 2000. Additions to the lichen flora of North America IX. *Micarea alabastrites* and *M. synotheoides*. – *Evansia* 17: 135–136.
- 42: Tønsberg, T. and McCune, B. 2001. Additions to the lichen flora of North America X. *Buellia arborea*. – *Evansia* 18: 128.
- 43: Tønsberg, T. pers. comm.
- 44: Williams, C. and Sillett, S. 2007. Epiphyte communities on redwood (*Sequoia sempervirens*) in northwestern California. – *Bryologist* 110: 420–452.