

## Some interesting lichenized fungi from old *Fraxinus excelsior* and *Ulmus glabra* in Norway, including four new country records

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The four lichenized fungi *Ramonia luteola*, *Strigula jamesii*, *S. phaea* and *Vezeadaea aestivalis* are reported as new to Norway. Comments are also given on the rare species *Enchylium coccophorum*, *Gomphillus calycioides*, *Piccolia ochrophora*, *Ramonia interjecta*, *Scytinium fragrans* and *Wadeana minuta*, for which several new findings were made that shed new light on their distribution and ecology in Norway.

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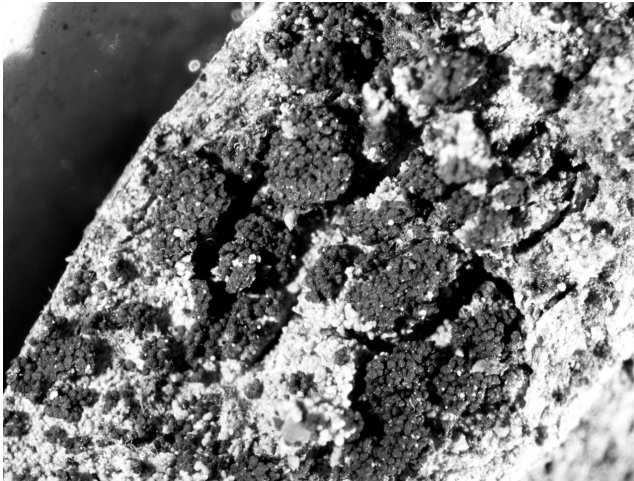
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### Introduction

A survey of lichenized and non-lichenized fungi, and bryophytes on old *Ulmus glabra* and *Fraxinus excelsior* trees in Norway was undertaken during 2012–2014. In total, 690 (400 elm, 290 ash) trees at 65 sites were surveyed and 675 records of 34 nationally red-listed epiphytic lichenized fungi were made (Nordén et al. 2015). Several species new to Norway were also found, three of which were reported in Nordén et al. (2013), and one in Nordén (2016). Reported here are four additional species as new to Norway, together with data on six rare species for which our findings contribute to the knowledge of their frequency, distribution and ecology. A few Swedish collections of the same species are also mentioned. All material is deposited in herbarium O. Abbreviations: BN = Björn Nordén, JBJ = John Bjarne Jordal.

*Enchylium coccophorum* (Tuck.) Otálora et al. (syn. *Collema coccophorum* Tuck.) in Norway known only from single collections from Oppland in 1863 and Nordland in 2008, as well as from Torne Lappmark in Sweden (Nordin et al. 2015). It is red-listed as CR in Norway (Henriksen & Hilmo 2015), but not red-listed in Sweden. In both Norway and Sweden it was reported from bare, more or less calciferous soil (Nordin et al. 2015). It is reported here as an epiphyte from both Norway and Sweden; both specimens were sterile and appeared as clustered black globules on the surface of the bark.

*Specimens examined: Norway. Vest-Agder:* Lyngdal, Hundingsland, 58°2'33.3"N, 7°1'24.8"E, alt. 62 m, on old *Fraxinus* tree, 21 May 2014, leg. BN, JBJ, det. P. M. Jørgensen. **Sweden. Småland:** Visingsö in lake Vättern, Brahekyrkan, 58°2'7.2"N, 14°20'37.2"E, alt. 100 m, on bark of large *Acer* sp. to the right of cemetery entrance, 27 Sept. 1992, leg. BN, det. P. M. Jørgensen (Fig. 1).



**Figure 1.** *Enchylium coccophorum* from Visingsö.

***Gomphillus calycioides*** (Delise ex Duby) Nyl. is a rare species known only from Hordaland in Norway in Scandinavia (Nordin et al. 2015). It is classified as CR in Norway (Henriksen & Hilmo 2015) and occurs in five localities in Artskart (Artsdatabanken & GBIF 2015). Two additional records are reported here; it was found on only three of the 290 investigated *Fraxinus* trees. It is a distinctive species, which seems to be strongly oceanic and very rare.

*Specimens examined:* **Norway. Hordaland:** Fusa, Femangerlia, 60°7'19.0"N, 5°46'2.1"E, alt. 42 m, on old *Fraxinus* close to river, 25 May 2013, leg., det., BN, JBJ; an additional specimen was found on old *Fraxinus* at the same site at 60°7'18.3"N 5°46'2.7"E, alt. 42 m. Os, Lio, 60°14'4.8"N, 5°33'53.2"E, alt. 52 m, on old *Fraxinus* in temperate deciduous forest, 24 May 2013, leg., det., BN, JBJ.

***Piccolia ochrophora*** (Nyl.) Hafellner (syn. *Strangospora ochrophora* (Nyl.) R. A. Anderson) is classified as VU in Norway (Henriksen & Hilmo 2015); it was mainly found on *Ulmus* but also on *Fraxinus* and *Sambucus* (Artsdatabanken & GBIF 2015). It has tiny reddish apothecia and therefore may easily be overlooked. It may be rare, as it was found on only five of the 400 surveyed *Ulmus* trees, and may prefer *Ulmus* over *Fraxinus* as it was not found on any of the 290 *Fraxinus* trees investigated.

*Specimens examined:* **Norway. Aust-Agder:** Bygland, Vormevik, 58°49'10.8"N, 7°45'42.5"E, alt. 265 m, on old *Ulmus* in temperate deciduous forest, 22 May 2014, leg. BN, JBJ, det. BN, JBJ. **Møre og Romsdal:** Stranda, Svarthammaren, 62°18'9.6"N, 7°6'59.8"E, alt. 315 m, on old *Ulmus* in temperate deciduous forest, 15 May 2012, leg. BN, JBJ, det. BN. **Oslo:** Rodeløkken sørvest, 59°54'46.2"N, 10°41'21.8"E, c. 22 m, on old *Ulmus* in grazed pasture, 18 Aug. 2014, leg., det. BN; an additional specimen was found on another old *Ulmus* at the same site at 59°54'41.1"N, 10°41'24.0"E, alt. 15 m. **Sogn og Fjordane:** Vik, Lee, 60°59'54.3"N, 6°25'52.8"E, alt. 320 m, on old *Ulmus* in grazed meadow, 16 June 2012, leg. BN, JBJ, det. BN; an additional specimen was found on another old *Ulmus* at the same location.

***Ramonia interjecta*** Coppins is not on the Norwegian red list and has five known localities in Norway, in Vestfold, Akershus and Sør-Trøndelag (Artsdatabanken & GBIF 2015). Due to its

inconspicuous thallus and small apothecia, it is notoriously difficult to spot in the field. Our record is the first for Vestlandet.

*Specimen examined: Norway. Hordaland:* Bergen, Seim, 60°25'42.6"N, 5°28'49.8"E, alt. 180 m, on old *Fraxinus* in temperate deciduous forest, 22 May 2014, leg. BN, JBJ, det. BN.

***Ramonia luteola*** Vězda is new to Norway, but was previously known from Gästrikland in Sweden (Nordin et al. 2015). As with other *Ramonia* species, it is probably rare, but it may also be overlooked.

*Specimens examined: Norway. Rogaland:* Strand, Rag, 59°6'7.1"N, 5°57'48.8"E, alt. 85 m, on old *Fraxinus* in temperate deciduous forest, 3 Oct. 2012, leg. BN, JBJ, det. G. Thor. **Østfold:** Moss, Jeløya, Alby, 59°25'25.8"N, 10°36'42.4"E, alt. 16 m, on old *Ulmus* in a park, 24 June 2014, leg., det. BN.

***Scytinium fragrans*** (Sm.) Otálora et al. (syn. *Collema fragrans* (Sm.) Ach.) was classified as CR on the Norwegian red-list (Henriksen & Hilmo 2015) and is known from a single locality in Norway: Sogn og Fjordane: Luster, Mørkrisdalen, farm Hyrnavollen; in 2012 it was refound on two trees at this site (61°32'49.6"N, 7°37'42.6"E). The population is very small and threatened since several old *Ulmus* trees have been blown down by a storm. Two new localities are reported below, one on *Fraxinus* new to Norway, and another on *Fagus sylvatica* in Sweden, where it is known from *Ulmus glabra* and *Populus tremula* at c. 20 sites from Skåne to Lule Lappmark, but is rare and declining and therefore classified as EN on the Swedish red-list (<http://artfakta.artdatabanken.se/taxon/387>).

*Specimens examined: Norway. Hordaland:* Os, Lio, 60°13'57.8"N, 5°33'46.1"E, alt. 83 m, on old *Fraxinus* in spruce plantation, 24 May 2013, leg., det. BN, JBJ, conf. P. M. Jørgensen. **Sogn og Fjordane:** Luster, Øyaskredene, 61°33'49.3"N, 7°44'52.9"E, alt. 147 m, on old *Ulmus* in temperate deciduous forest, leg., det. JBJ, conf. BN.

***Strigula jamesii*** (Swinscow) R. C. Harris is new to Norway. In Sweden, it has been found on old trunks of *Ulmus glabra*, *U. laevis* and *U. minor* in Blekinge, Öland, Gotland and Bohuslän (Nordin et al. 2015). The Norwegian specimens were found on old *Ulmus glabra*, on the base of the trunk up to 1 m above the ground. *Strigula jamesii* can in the field be confused with *Anisomeridium polypori* when this species occurs without its characteristic pycnidia, but the latter has a whiter thallus.

*Specimens examined: Norway. Aust-Agder:* Froland, Ytre Lauvrak, Fluga, Klefjell SV, 58°35'16.6"N, 8°19'27.7"E, alt. 295 m, on bark of old *Ulmus* in temperate deciduous forest, 26 Sept. 2014, leg., det., BN. **Nord-Trøndelag:** Stjørdal, Liaberga nature reserve, 63°33'11.4"N, 11°7'38.2"E, alt. 243 m, on old *Ulmus* in temperate deciduous forest, 12 Sept. 2012, leg., det. JBJ, conf. G. Thor. **Sør-Trøndelag:** Rissa, Leinslia, 63°30'2.9"N, 10°2'26.5"E, alt. 90 m, on old *Ulmus* in temperate deciduous forest, 10 May 2014, leg., det. BN, JBJ; additional specimens were found on similar *Ulmus* trees at the same site at 63°30'2.5"N, 10°2'28.1"E, alt. 90 m and 63°30'1.6"N, 10°2'32.0"E, alt. 97 m.

***Strigula phaea*** (Ach.) R. C. Harris (Fig. 1 D–F) is new to Fennoscandia (Nordin et al. 2014). Our records are all epiphytic on old *Ulmus* trunks. Although the two *Strigula* species presented here are relatively inconspicuous, they can often be identified in the field; the dark thallus of *S. phaea*, for example, is distinctive. It appears to have a southwestern, probably oceanic, distribution.

*Specimens examined: Norway. Hordaland:* Bømlo, Spyssoya, Stølsvika, southern part, 59°43'30.3"E, 5°22'18.7"N, alt. 35 m, on bark of very large *Ulmus* in grazed woodland, 11 May 2013, leg. BN, JBJ, det. BN, T. Læssøe, conf. B. Coppins; Kvam, Strandadalen, Jomfrustolen, 60°18'51.5"E, 5°58'49.0"N, alt. 349 m, on bark of old *Ulmus* in temperate deciduous forest, 22 May 2013, leg. JBJ, det. BN; Samnanger, Skarsvatnet, 60°23'00.1"N, 5°41'10.4"E, alt. 135 m, on bark of old *Ulmus* tree in temperate deciduous forest, 23 May 2013, leg. BN, JBJ (2144, 2199, 2219), det. BN; additional specimens were found on two other similar *Ulmus* trees at the same site at 60°22'59.1"N, 5°41'7.6"E, alt. 131 m and 60°23'0.0"N, 5°41'7.2"E, alt. 136 m.

*Veizdaea aestivalis* (Ohlert) Tscherm.-Woess & Poelt is new to Norway. In Sweden it has been found in Skåne, Öland, Halland, Västmanland and Hälsningsland, where it was reported from soil (Nordin et al. 2014); however, BN found it as epiphytic on *Alnus glutinosa* in Skåne. It can be identified in the field by its low pale to brownish apothecia on bark or dead bryophytes, or soil. In strong magnification the individual asci with their tightly clasping paraphyses can be seen protruding from the apothecial surface.

*Specimens examined: Norway.* Etne, Frettestranda, 59°43'11.1"N, 6°9'31.3"E, alt. 183 m, on old *Fraxinus* in temperate deciduous forest, 9 May 2013, leg. BN, JBJ, det. BN; Samnanger Kvernnesvatnet, 60°23'10.4"N, 5°42'38.5"E, alt. 76 m, on bark of old *Ulmus* in temperate deciduous forest, 21 May 2013, leg. BN, JBJ., det. BN; Voss, Sandbrekkene, 60°42'55.4"N, 6°7'55.5"E, alt. 367 m, on bark of an old *Ulmus* in temperate deciduous forest, 12 May 2014, leg. BN, JBJ, det. BN (Fig. 2).

*Wadeana minuta* Coppins & P. James is in Norway previously collected by Brian Coppins in Bergen (Artsdatabanken & GBIF 2015). It is oceanic (Jørgensen & Nordin 2009) and does not occur in Sweden. It is not red-listed in Norway. It can be mistaken for an *Opegrapha* or similar species, but its polysporous asci are distinctive. As it was found at only three sites in Hordaland (similar to the first known locality found by Coppins), it may have a restricted distribution in Norway.

*Specimens examined: Norway. Hordaland:* Etne, Tunesvikstranda, 59°44'2.4"N, 5°58'24.7"E, alt. 170 m, on old *Fraxinus* in temperate deciduous forest, 13 May 2013, leg. JBJ, det. BN; Masfjorden, Nordgjelen, 60°54'22.4"N, 5°36'37.1"E, alt. 196 m, on bark of old *Ulmus* in temperate deciduous forest, 30 May 2013, leg., det. JBJ (TRH); additional specimens were found on five other old *Ulmus* trees at the same site at 60°54'28.4–30.2"N, 5°36'21.7–32.4"E, alt. 245–361 m; Samnanger, Skarsvatnet, 60°22'58.1"N, 5°41'9.1"E, alt. 86 m, on bark of old *Ulmus* in temperate deciduous forest, 23 May 2013, leg., det. BN, JBJ.

## Discussion

Our findings confirm that old deciduous trees in Norway are important habitats for epiphytic lichenized fungi (Nordén et al. 2015). Regrettably, *Fraxinus* and *Ulmus* are highly endangered due ash dieback and Dutch elm disease respectively, and old trees are often threatened by the intrusion of spruce trees, excessive deer browsing during winter, and other factors (Nordén et al. 2015). There is an urgent need for an action plan for the protection and management of such sites. Western Norway still has relatively large areas of old temperate deciduous woodland, some of which may be hotspots for biodiversity of international importance. Furthermore, old *Ulmus* trees in western Norway are important from a European perspective since they occur in the few remaining areas as yet unaffected by Dutch elm disease.



**Figure 2.** *Vezdaea aestivalis* from Voss, Sandbrekkene.

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### References

- Henriksen, S. & Hilmo, O. (ed.) 2015. Norsk rødliste for arter [Norwegian Red List for Species] 2015. Artsdatabanken, Norge.
- Jørgensen, P. M. & Nordin, A. 2009. Lichens known mainly from Norwegian type-specimens. *Graphis Scripta* **21**: 1–20.
- Nordén, B. 2016. A corticolous *Verrucaria* new to Norway. *Graphis Scripta* **28**: 14–16.
- Nordén, B., Evju, M. & Jordal, J. B. 2015. Old temperate deciduous trees – a hotspot habitat. Final report from the third period of the ARKO project (Survey and monitoring of red-listed species). NINA Rapport 1168. 91 pp.
- Nordén, B., Jordal, J. B. & Bratli, H. 2013. *Bacidia incompta*, *Pyrenula nitidella* and *Schismatomma decolorans*, three lichenized fungi on old deciduous trees new to Norway. *Graphis Scripta* **25**: 44–47.
- Nordin, A., Moberg, R., Tønsberg, T., Vitikainen, O., Dalsätt, Å., Myrdal, M., Snitting, D. & Ekman, S. 2015. Santesson’s Checklist of Fennoscandian Lichen-forming and Lichenicolous Fungi. <http://130.238.83.220/santesson/home.php?-link=Home> [Accessed on 28 June 2015] *n*