

WIDESPREAD INFECTION OF THE HAIR LICHEN GENUS, *BRYORIA*, BY A PREVIOUSLY UNKNOWN FUNGAL PATHOGEN

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Bryoria is one of the dominant genera of hair lichens in western North America and an integral part of high elevation conifer forest ecosystems. In areas where *Bryoria* is abundant, it is not rare to find a non-negligible percentage of thalli in which the thalline filaments become conglutinated and brittle dead zones form, so-called “rat tails”. Until now, the underlying cause or causes for “rat tails” have been unknown. We sampled *Bryoria* thalli across western Canada and monitored thallus dieback at different times of the year. We found that the dieback phenomenon is strongly associated with the aggressive growth in winter of a mould-forming basidiomycete not previously known to associate with *Bryoria*, belonging to the genus *Athelia*, a large genus of economically significant pathogens. To place the *Bryoria*-associated fungi in the broader genus, we designed *Athelia*-specific primers for two gene regions (*EF1a* and ITS) and screened both the mould directly and apparently uninfected thalli to assess potential latent occurrence. We also sequenced the ascomycete fungus of the hosts to try to establish if any specific groups of *Bryoria* were more commonly infected than others. The pathogen appears to be closely related to *Athelia acrospora*, a species heretofore known only from dead wood. It preferentially infects members of *Bryoria* sect. *Implexae* and *Bryoria fremontii*, as well as, occasionally, associated foliose and fruticose species within Parmeliaceae. Whether or not this widespread infection of *Bryoria* in western North America is new or simply an overlooked phenomenon is difficult to determine with certainty. This research will serve as a benchmark for documenting the pathogenic outbreak affecting an ecologically significant lichen genus.