

Population changes of *Globisporangium* spp. in a *Sanionia* moss colony in Ny-Ålesund and their infection to *Sanionia* moss in an in vitro test

Natsumi Fujii¹ and Motoaki Tojo¹

¹Graduate School of Life and Environmental Sciences
Osaka Prefecture University

The genus *Globisporangium*, which is separated from genus *Pythium*, is known as soilborne plant pathogens worldwide. Some species of this genus can infect mosses in polar regions (Tojo and Newsham 2012, Hoshino et al. 2020). *G. polare* is the most common moss parasite in polar regions which have a bipolar distribution (Tojo et al. 2012). Since *Globisporangium* spp. including *G. polare* are commonly isolated from mosses in polar regions (Tojo and Newsham 2012, Tojo et al. 2012), it has been required to clarify their population changes and infection ability to the mosses. In this study, changes of population and species construction of moss inhabiting *Globisporangium* were investigated in summer seasons from 2003 to 2018 for *Sanionia* moss colonies at the north side cliff of Japanese Ny-Ålesund observatory, Spitsbergen Island, Norway. Infection ability to the moss was also examined for the *Globisporangium* isolates obtained in the 2018 investigation.

The species identification was performed based on sequences of the internal transcribed spacer (ITS) of the ribosomal DNA, microscopic morphology of sexual and asexual organs, and growth speed of mycelium on an agar plate. Six *Globisporangium* species, which categorized as *Globisporangium* sp. 1, sp. 2 (= *G. polare*) sp. 3, sp. 4, sp. 5, sp. 6, were isolated from the moss colonies through the sixteen-years investigation. Their total population was increased from 2003 to 2010 and was decreased from 2010 to 2018, although the patterns of population change was different among the six *Globisporangium* spp. An in vitro infection test to *Sanionia* moss was conducted by using the five *Globisporangium* spp. isolated in the 2018 investigation. All the five species formed hyphal swellings, which is asexual spores of *Globisporangium*, in cells of the moss.

Present study first demonstrated that all the five species of *Globisporangium* from *Sanionia* moss at Ny-Ålesund can infect to the moss in an in vitro inoculation test. Results from the field survey suggest that total population of moss inhabiting *Globisporangium* is decreasing from 2010 to 2018.

References

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