**SPECIES-SPECIFIC RESPONSES TO LONG TERM PASSIVE WARMING IN ANTARCTIC LICHENS ON KING GEORGE ISLAND, SOUTH SHETLAND ARCHIPELAGO.**

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**Abstract**

Lichens are the most successful terrestrial colonizers in Antarctica. There are currently more than 350 species known from the permanent ice-free areas, some of them almost reaching the South Pole. Although their pioneer role is principally enabled by high cold tolerance, highest metabolic and growth activity occurs during a short spring-summer season. However little is known about the effect of global warming on Antarctic lichens. Measured temperature increase is affecting particularly the west part of the Antarctic Peninsula, where lichen biodiversity is highest. We installed open top chamber to study lichen responses to experimental warming on Fildes Peninsula. We found that relative cover increased 40% after 6 years of passive warming, being two fruticulose species, viz.: *Usnea aurantiacoatra* and *Himantormia lugubris,* the most favored; however *Placopsis Antarctica,* a crustose species, was negatively affected by the treatment. We found that carbon percentage was similar in OTC and control samples for the former species; however, in *Placopsis antarctica* a strong decrease of N, and C was observed. Stable N isotope content was different between species: the highest value was found in *Cladonia borealis* (δ15N = 10), in the other three species (*Placopsis antarctica*, *Usnea aurantiacoatra* and *Himantormia lugubris*) values fluctuated between -1.1 and -12.7.- Antioxidant content showed no differences between OTCs and control plots, but marked differences between species. Our data provide evidence of species-specific responses to passive warming treatment, where the most affected species is the endemic crustose *Placopsis antarctica*: the decrease of nitrogen content measured in this species could be an effect of reduced function of the cephalodia and their cyanobacterial symbionts. Grant: INACH RT2716; FONDECYT 1181745.

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