

SESSION: Ecosystems, Biodiversity and Biodiscovery

MARS Themes:

Understanding natural and anthropogenic drivers of change

Title:

Detecting signals of adaptive selection of an invasive springtail on sub-Antarctic Marion Island

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Abstract:

Springtails are important soil dwelling microarthropods with a global distribution. They play a role in nutrient cycling and are commonly used as bioindicators of ecosystem health. On sub-Antarctic Marion Island, there are no vertebrate herbivores, but springtails, invertebrate herbivores, are abundant and therefore fulfil the role of herbivory, which makes them an ecologically important group on the island. Our study organism is the collembolan, *Isotomurus maculatus*, which has a natural distribution that includes Europe and North America, with some individuals present in the Western Cape, South Africa. It was introduced to Marion Island in the late 1970s and is now considered to be an invasive species on the island. Since *I. maculatus* is native to regions that are hot and dry, how did this springtail adapt to a cold and harsh environment such as that on Marion Island? We aim to answer this by identifying possible signals of adaptive selection, by sequencing the transcriptome of *I. maculatus* under different thermal and humidity conditions. We will apply a comparative transcriptomic approach to identify signals from genes and metabolic pathways involved in local adaptation and pinpoint the biochemical mechanisms that facilitate adaptation to Marion Island. The genomic basis of adaptation in invasive species is not well understood, therefore, the implication of this study is far-reaching as it will help to inform the management of invasive species.

Format:

10-min oral

Keywords:

Springtails; Marion Island; Adaptation; Invasive species