

Review

Antarctic Studies Show Lichens to be Excellent Biomonitorers of Climate Change

Leopoldo G. Sancho ^{1,*}, Ana Pintado ^{1,†}  and T. G. Allan Green ^{1,2,†}

¹ Departamento de Farmacología, Farmacognosia y Botánica, Facultad de Farmacia, Universidad Complutense, 28040 Madrid, Spain; apintado@ucm.es (A.P.); greentga@waikato.ac.nz (T.G.A.G.)

² Biological Sciences, Waikato University, Hamilton 3240, New Zealand

* Correspondence: sancholg@ucm.es

† These authors contributed equally to this work.

Received: 8 February 2019; Accepted: 16 March 2019; Published: 19 March 2019



Abstract: Lichens have been used as biomonitorers for multiple purposes. They are well-known as air pollution indicators around urban and industrial centers. More recently, several attempts have been made to use lichens as monitors of climate change especially in alpine and polar regions. In this paper, we review the value of saxicolous lichens for monitoring environmental changes in Antarctic regions. The pristine Antarctica offers a unique opportunity to study the effects of climate change along a latitudinal gradient that extends between 62° and 87° S. Both lichen species diversity and thallus growth rate seem to show significant correlations to mean annual temperature for gradients across the continent as well as to short time climate oscillation in the Antarctic Peninsula. Competition interactions appear to be small so that individual thalli develop in balance with environmental conditions and, as a result, can indicate the trends in productivity for discrete time intervals over long periods of time.

Keywords: Antarctica; biomonitoring; lichens; growth rate; diversity; temperature; precipitation; climate change