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ORIGINAL PAPER

Vegetation of Barton Peninsula in the neighbourhood of King Sejong Station (King George Island, maritime Antarctic)

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Abstract Plant communities were studied on Barton Peninsula around King Sejong Station on King George Island, maritime Antarctic. The objective of this study was to document the occurrence and distribution of plant assemblages to provide the bases for monitoring the effects of environmental changes and human impact on the vegetation of this area. Approximately 47% of the investigated area was covered by vegetation. Crustose lichens showed the highest mean cover (21%) among vegetation components. The total mean cover of the four dominant taxa, together with the other three major subdominant components, i.e., *Usnea* spp., *Andreaea* spp. and *Sanionia georgico-uncinata*, was 78.2% of the total cover of all the species. Lichen cover and species diversity increased with altitude and the time of exposure from snow. Lichens contributed substantially more to the increased species density and diversity than did bryophytes. Ten plant communities were recognized within the study area. All of them belong to the Antarctic cryptogam tundra formation; they were grouped into four subformations: fruticose lichen and moss cushion subformation, crustose lichen subformation, moss carpet subformation and moss hummock subformation. The moss turf subformation was not found on this region. The Antarctic herb tundra formation was also not found; however, the populations of both Antarctic vascular plants have rapidly expanded around Barton Peninsula in recent years, which may allow development of the Antarctic herb tundra formation in the future.

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Introduction

In recent decades, the Antarctic has undergone significant environmental change, including significant temperature increases in the maritime region and the greatest increases in UV-B radiation levels in the world (Robinson et al. 2003). Ecological studies of the terrestrial plants and vegetation in the Antarctic in relation to climate change are important. The Antarctic plants grow at the physiological limits of survival; consequently, even slight changes in growth conditions are likely to have a large effect. The Antarctic environment probably offers the most significant baseline with which global atmospheric changes may be evaluated. The maritime Antarctic areas are sensitive to climate change because of their geographical location (Lewis Smith 1984, 1990; Longton 1988); thus, studies of terrestrial plant ecology and ecophysiology in this region are necessary to estimate the direction and rate of environmental and ecological changes.

To monitor plant communities in relation to environmental changes on a long-term scale, King George Island is one of the most appropriate representative localities of the maritime Antarctic regions (Ochyra 1998). This island has luxuriant cryptogamic vegetation and there are also two vascular plants. The vegetation of the island is relatively well described. Most previous studies have focused on description of

availability, wind exposure and geological data, which are responsible for the flosrisic complexity and diversity of community types.

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