

MASARYK UNIVERSITY

# STRUCTURE AND FUNCTION OF ANTARCTIC TERRESTRIAL ECOSYSTEMS

Electronic Conference on Interactions between Antarctic Life and  
Environmental Factors, IPY-related Research  
Brno, October 22th-23th, 2009



## Book of Abstracts and Contributed Papers

Brno 2009

## Overview of studies on utilization of vascular plants by Antarctic birds at nesting sites

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### Introduction:

During the last 50 years, the Maritime Antarctic experienced significant climate warming. As a consequence, population of the only two vascular plants native to the Antarctic, i.e. *Deschampsia antarctica* and *Colobanthus quitensis* dispersed and established over previously unoccupied territories. There are different hypotheses about the time span of their initial invasion of this region. Being successful, both species must be effectively adapted to spread over ice-free areas isolated by vast seas and/or glaciers. Their seeds may have been imported by wind and/or by birds. While winds most probably disperse only larger propagules within habitats, birds may carry also tufts probably not only among the (sub-)Antarctic islands but also from South America. There is a number of indications that birds can effectively disperse vegetative plant material. Smaller or larger vegetative parts of the Antarctic vascular plants are able to survive transportation by birds and can successfully established in suitable environmental conditions in yet uncolonized localities. However, the bird species involved, the manner(s) of plants' engagement, and itineraries of their travels remain unclear. Therefore, the aim of the present study was to investigate utilization of vascular plants in the nests of *Larus dominicanus* and both *Catharacta* species at two distant locations in the Maritime Antarctic.

### Materials and Methods:

The field survey was conducted during the austral summer seasons 2006/07 and 2007/08. It involved investigations of nesting habits of *Larus dominicanus* and two skua species, *Catharacta maccormiki* and *Catharacta lonnbergi*, at two distant locations, i.e.: the Point Thomas area (King George Island) and the Argentine Islands region including a few sites on the western shore of the Antarctic Peninsula. All accessible nests of the investigated bird species were inspected for presence of parts or whole vascular plants. On average 20 nests of each bird species were investigated in each region. All the investigated nests were photographed. To avoid disturbance to occupied nest their inspections were performed with special care and in short sessions only.

### Results and Discussion:

The data provide evidence that the investigated birds significantly contribute to dispersal and establishment of the Antarctic vascular plants. The results also demonstrate that *L. dominicanus* at both investigated regions use vascular plants for nest building on a regular basis. Besides dried fragments of both vascular plants species, alive and well rooted clumps were also observed in the gulls' nests. The utilization of vascular plants by gulls is, therefore, independent of the geographic location. In case of skuas' nests (the species were not distinguished), vascular plants were found in all nests from the Point Thomas area, while the nests from the Argentine Islands region contained almost exclusively mosses. It seems that only *C. maccormiki* is present on the Argentine Islands region, while in the Point Thomas area both species, *C. maccormiki* and morphologically similar but larger *C. a.lonnbergi*, occur. The use of vascular plants in nests building seems to be species-specific. However,

both species and their hybrids use only plants from immediately adjacent territories and both mosses and vascular plant appear to be utilized by these birds. Therefore, the species-specificity in the use of vascular plants may arise only from plant communities surroundings their nesting sites. Therefore it seems that *L. dominicanus* is probably an important vector distributing vascular plants over the Maritime Antarctic. The distance of such transport needs more detailed investigation. *Catharacta* species, on the other hand, are probably responsible for local propagation, mixing or rejuvenation of the populations.

**Acknowledgments:** We thank I. Dykyy for providing part of the data for this study. Our fieldwork was supported by National Scientific Antarctic Center of Ukraine and Department of Antarctic Biology PAS. This work was also supported under the agreement on scientific cooperation between National Academy of Sciences of Ukraine and Polish Academy of Sciences.