VEGETAL COMMUNITIES FROM ICE-FREE AREAS OF COPACABANA, KING GEORGE ISLAND, ANTARCTICA

<http://dx.doi.org/10.4322/apa.2014.004>

Antonio Batista Pereira^{1,2*}, Márcio Rocha Francelino^{2,3} & Luiz Fernando Wurdig Roesch^{1,2}

¹ Universidade Federal do Pampa - UNIPAMPA, Rio Grande do Sul, Brasil

² Instituto Nacional de Ciência e Tecnologia Antártico de Pesquisas Ambientais – INCT-APA

³ Universidade Federal Rural do Rio de Janeiro – UFRRJ, Rio de Janeiro, Brasil

*e-mail: antoniopereira@unipampa.edu.br

The vegetal communities from ice-free areas of King George Island show a close relationship with many environmental factors. In this respect, the Antarctic vegetal communities have become a good indicator for the study of climate change, geomorphology and hydrology. Measuring the actual area occupied by each type of community will help to monitor the development of the community and better understand the geo-environmental structure of ice-free areas in Antarctic (Figure 1).

The aim of this study has been to map and evaluate the ecological relationships of the vegetal communities with ice-free areas adjacent to Admiralty Bay – Antarctica.

The study was carried out in about 450 hectares of ice-free areas located on the west coast of Admiralty Bay, King George Island, Antarctica. The whole area was mapped using a differential GPS (DGPS) model Promark 2. The DGPS was run in the cinematic mode and the coordinators were corrected through the use of a base station and the Ashtech Solutions® 2.6 programme. The technique allows for a 50 cm precision. The vegetal communities were delimited by using the square method adapted to the Antarctic conditions and based on its floristic composition, physiognomy and association.

Seven vegetal communities were identified by this methodology:

1. **Deschampsia Communities;** are located in areas found in rocky elevations were the predominant vegetation is composed of *Deschampsia antarctica* Desv. (Poaceae) (Figure 2), associated with *Colobanthus quitensis* (Kunth.) Bart. (Caryophyllaceae), and mosses represented by small

populations of *Sanionia uncinata* Hedw. Loeske in dry areas and *Bryum* spp. in wet areas.

2. **Deschampsia and moss communities;** these communities occur far from the coastal zone. The presence of *Deschampsia antarctica* decreases considerably in size and density but there is an increase in the presence of *Colobanthus quitensis* and mosses mainly *Sanionia uncinata* and *Polytrichastrum alpinum* (Hedw.) G.L.Sm. in the places under influence of birds. In others areas the predominant populations found, were *Polytrichum juniperinum* Hedw, *P. strictum* Brid. and *P. piliferum* Hedw.

3. **Mosses and Deschampsia communities;** these are very similar to the *Deschampsia* and moss communities. However, the major difference is related to the greater biodiversity and biomass of mosses in association with flowering plants. The presence of these communities is strongly associated with the soil moisture and drainage lines.

4. **Carpets of moss communities;** in these communities there is a predominance of *Sanionia uncinata* many in those areas with absence of soil. In this case, the *S. uncinata* grows directly on the surface of the rocks.

5. **Moss communities;** the occurrence of these communities is associated with the presence of soil. When soil is present, the biodiversity of mosses is relatively large with the predominance of *Polytrichum* spp, *Syntrichia* spp and many species of *Bryum*.

Figure 1. Map showing the vegetal communities from ice-free areas of Copacabana, King George Island, Antarctica.

Figure 2. *Deschampsia antarctica* Desv. (Poaceae) Photo: Antônio Batista Pereira.

6. Lichen communities; these communities are found in outcrop rocks or areas with large fragments of rocks where the fine sediments are washed out by the water from the defrosting process. There is a predominance of *Usnea* genera and species of crusty lichens. The biodiversity of these communities are extremely dependent on the influence of the bird colonies. The moss populations are occasional.

7. Emergent communities; these communities are characterised by the presence of small populations of *Deschampsia antarctica* and *Colobanthus quitensis*. Mosses are represented by small populations of *Sanionia uncinata*, *Bryum* spp and *Syntrichia* spp.

Acknowledgements

This work was supported by CNPq (process 574018/2008-5), FAPERJ (process E-26/170.023/2008), MMA, MCT and CIRM.