An interdisciplinary approach to vegetation mapping on lichen-dominated systems in high-arctic environment, Ny Ålesund (Svalbard)


with 13 figures and 1 table

Abstract. A vegetation map of the Ny Ålesund area (Svalbard) was constructed on the basis of "vegetation complexes" with the help of systematic plots along transects. The method enables to handle the mosaic effects because the sampling plots are very small (10 cm x 10 cm) and emphasizes the vegetation structure at a very low scale. The analysis of the obtained types and complexes shows a good correlation with the physical environment. A holistic view of the relationships between vegetation and geomorphological data is provided.

Résumé. Une carte de végétation de la région de Ny Ålesund (Svalbard) a été établie par la méthode des "complexes de végétation", après de nombreux relevés systématiques le long de plusieurs transects. Cette méthode, capable de discerner les effets de mosaïque, avec des relevés de faibles dimensions (10 cm x 10 cm), fait ressortir la structure de la végétation à très petite échelle. L'analyse des complexes de végétation montre une bonne corrélation avec les facteurs physiques de l'environnement, démontrant par le fait l'influence étroite des données géomorphologiques.

Introduction

Aim of this paper is to provide an example of vegetation mapping in a high-arctic environment. Despite the growing interest in the study of the tundra biome, only a few examples of vegetation mapping for high arctic areas are available in the literature (WEBBER & WALKER 1975, WALKER 1977, KOMARKOVA & WEBBER 1978, 1980). In most of these papers the mapping units were defined on a subjective floristic-physiognomic basis, without a prior phytosociological analysis of sampling units in terms of their whole floristic composition. The study of tundra vegetation presents difficulties that are rarely found in the study of vegetation in the temperate belt, so that the very existence of plant communities in the arctic environment has been denied by some plant ecologists (GRIGGS 1934, SIGAFOOS 1952, RAUP 1951). The main methodological problems are: 1) the delimitation of floristically homogeneous sample plots, 2) the choice of an adequate sample size. Their solution is critical because of the generally small size of the single plants and the pronounced microgeomorphological structuring of the ground by cryoturbation, with a frequent occurrence of...