樹木―ツンドラ移行帯におけるパッチ状植物群集の集合メカニズム

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The assembly mechanisms of patchy-tundra plant community at the forest-tundra boundary

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Understanding the roles of environmental conditions and species interactions in shaping plant community is among the oldest challenges in ecology and has now become a prerequisite for predicting the effects on plant biodiversity to global change (HilleRisLambers et al. 2012). Especially, arctic areas are thought to experience the dramatic shifts in vegetation composition and diversity because of the rapid warming and plant species vulnerability (Post et al. 2009, Science). To cope with the impact of global warming on arctic tundra, careful assessment of plant community assembly mechanisms from finer scale is important.

Our study site was at the eastern coast of Hudson Bay (55°16’50” N, 77°45’10” W) in northern Quebec (Figure. 1), the terrestrial boundary between taiga and tundra (Bhiry et al. 2011). In this area, topographic features had strong effects on the vegetation. The taiga forest existed only along the valley and on the parabolic dunes, there were patchy- prostrate shrub tundra with no trees owing to the harsh environmental conditions (Figure. 2). Despite the similar topographic conditions, ecologically many kinds of species are coexisting in the shrub tundra.

The vegetation survey quadrats (1m×1m) was established at the center of every patches in the 10m×150m plots. In addition to the vegetation data, we measured local environmental conditions at every patches and functional trait data every plant species.

From these data, we investigated what mechanisms promote the plant community assembly (the role of local environmental condition and species interactions) and generate diversity by assessing the functional trait diversity pattern of coexisting species.

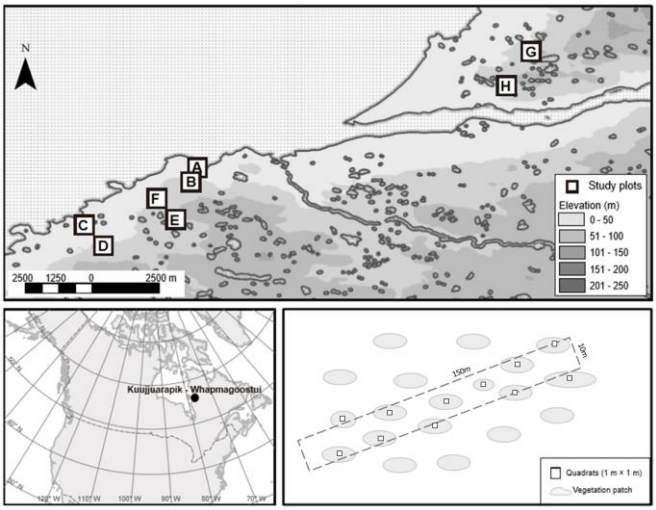

Figure. 1 Maps of the study sites and designs.

Figure. 2 An overview of the study area (Patch-tundra and forests in the distance) from the parabolic dunes.

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