

Determinants on vegetation differentiation on a post-mined peatland in
Sarobetsu Mire, northern Japan.

(サロベツ湿原泥炭採掘跡地における植生分化の決定要因)

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Although fast succession is desirable for ecosystem restoration after disturbances, the determinants on successional pace have been unclear because of multi-interactions between plant communities and the environments. To detect the determinants on successional pace, re-vegetation patterns and its related environmental factors were investigated on a post-mined peatland in Sarobetsu mire, northern Japan, where *Sphagnum* mosses were predominant in the un-mined mire. The successional sere in the whole areas of post-mined peatland was: bareground (BG) – *Rhynchospora alba* grassland (RA) – *Moliniopsis japonica* grassland (MJ). These three communities, BG, RA and MJ, were developed even on the even-aged mined sites. By using the three habitats developed on the even-aged mined sites with non-mined control site dominated by *Sphagnum* (SP), the researches of vegetation were conducted with monitoring above- and below-ground environments in 2015 and 2016. I seasonally monitored temperature, light intensity and physio-chemistry of peat-pore water (electrical conductivity, pH, nitrogen and phosphorus). The seeds of five common species were collected in the late autumn 2015 and were sown to each habitat in the early spring of 2016. The seedlings were harvested in the summer of 2016. The litter thickness and peat-pore water were measured in each habitat in the spring of 2017.

The results showed that species richness and plant cover increased with increase from BG to SP. BG allowed the establishment of *R. alba* only, due probably to the stresses and seed immigration limitation. On RA, *M. japonica* established well, suggesting that facilitative effects of *R. alba* promoted the vegetation replacement at this stage. The establishment of *Sphagnum* was restricted on MJ where the litter accumulated well and shade became intense. Therefore, the determinants on successional paces were different at different stages of succession. Therefore, to promote fast successional change, the respective determinants on successional changes should be mentioned for the restoration of bogs. These findings provide new insights that using a single restoration technique sometimes delays the succession at a certain stage and switching the techniques is required appropriately at each successional stage.