

## PRELIMINARY REPORT UPON SOIL CRUSTING IN THE SONGNEN STEPPES, NORTHEAST CHINA

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### SUMMARY

Biological soil crusts are complex associations of lichens, mosses, liverworts, cyanobacteria, fungi and bacteria that are intimately bound onto surficial soils (1), which strongly affect mass and energy movement and the partitioning of the water and nutrient balance with critical significance for ecosystems in arid and semiarid areas (2). At present, crusting processes are acknowledged with respect to the physical, chemical and biological dimensions, whereas biological crusts are more addressed in the recent days.

This study attempts to examine the dynamics of soil crusts under disturbances of grazing, alkalinization and cultivation, and thus their environmental and ecological roles in the Songnen Steppes, N China. Involved experiments were conducted at the Changling *Leymus chinensis* Steppe Reserves of Jilin Province with an onsite field survey and a parallel plot-based incubation experiment indoors since May, 2007. Selected soils for crusting survey and incubation are sodic-saline soil, meadow soil and black soil respectively. Grazing pressures in four levels such as no grazing, light, moderate and severe grazing, and three replicates were assigned. Therefore, eighteen plots were set up for crusting incubation and wild survey. Both samplings were simultaneously carried out once a week throughout a year. Site survey, biological crusting species identification under microscope observation and soil analysis were then conducted. Present results indicate that (i) cover-abundance was significantly higher in the unvegetated microsites than in the vegetated; (ii) species richness was not significantly different between the grazing-cultivation treatments but on average, there were significantly more species in the unvegetated microsites than in the vegetated, except the sodic-saline plots; (iii) grazing and cultivation resulted in significantly larger cover of bare soil and thus greater crust cover, suggesting farming scenarios will stimulate the abundance and cover of soil crust organisms; (iv) soil alkalinization will significantly depress soil crusting probably by impeding the activities and development of soil biological organisms.

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1. Eldridge D. J., Greene R. S. B., 1994, Microbiotic soil crusts: a review of their roles in soil and ecological processes in the rangelands of Australia. Australian Journal of Soil Research 32, 389-415.
2. Patrick E., 2002, Researching crusting soils: themes, trends, recent developments and implications for managing soil and water resources in dry areas. Progress in Physical Geography 26, 3: 442-461.