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Ecological characteristics of halophytes in the arid areas

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Introduction Scarce water resources in arid areas force people to use highly saline water for irrigation. The practices result in the expansion of areas affected by secondary salinization (Szabolcs 1986). The countermeasures to cope with the soil salinization problem include the utilization of salt tolerant crops or halophytes.

Materials and methods The field survey was carried out during June to October, 2003 at 5 sampling sites distributed on salt affected areas in Middle to Western parts of Inner Mongolia (Ejinor, Xlingol, Cagnnor, Wlingsu and Jrndi). The halophytic plant samples were collected from 1m×1m size quadrats. The scientific names of families and species of plants were identified and recorded. The number of stocks, size of stocks, plant height and biomass of each species were measured.

Results Plant ecological analysis was carried out around salt lakes and salt affected areas in central to western parts of Inner Mongolia. Special attention was paid on the usage of plants. Halophytes of 20 families with 113 species were recorded on 5 sites. Among them, there were 34 medicinal plant species and 41 forage plant species (among them, 11 species have high quality for forage). Twelve species were common with Japanese flora. Fifty eight species have their close relatives in Japanese flora. Plants with no close relatives in Japanese flora numbered 40 in family level and 3 in species level. *Chenopodiaceae* plants like *Salicornia*, *Suaeda* and *Kalidium* formed colonies as pioneer plants on the salt affected areas in central to western parts of Inner Mongolia. *Phragmites australis*, *Salicornia europaea*, and *Suaeda corniculata* produced high biomass at the central parts of salt affected areas. The biomass of these species was 23.8, 8.9, and 7.2 kg/m², respectively. Species diversity calculated by Simpson's index ranged between 0.000 and 0.791. On the plot where salt accumulated more, the index fell around 0 showing the breakdown of diversity.

Conclusions From the experimental results stated above, the following suggestions for the utilization of halophytes were obtained. Halophytes such as *Salicornia*, *Suaeda* and others distribute naturally in the salt affected areas. Their biomass production is quite high. Selecting the proper species, animal feed can be produced. The feasibility expands the options of countermeasures to resume destroyed plant vegetations.

This paper intends to introduce the major plant species, which distribute on the salt affected grasslands in middle and western part of Inner Mongolia, with their characteristics. The utilization of these species was also discussed. The associated objective of the paper is to provide a convenient list of plant species to assist Japanese researchers for their field studies or for their references in the laboratories.

Reference

Szabolcs J. (1986). Agronomical and ecological impact of irrigation on soil and water salinity. *Adv. soil Sci* 4:189-218.