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J. Mi

*China Agricultural University, China*

J. Wang

*China Agricultural University, China*

L. Lin

*China Agricultural University, China*

Kun Wang

*China Agricultural University, China*

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## The response of *Potentilla acaulis* population property to desertification grassland in agro-pastoral ecotone of northern China

J.Mi, J.Wang, L.Lin and K.Wang

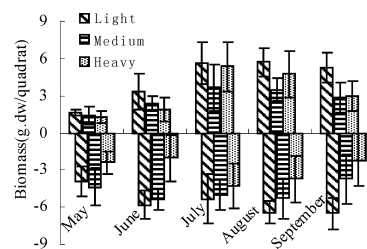
Institute of Grassland Science, China Agricultural University, Beijing 100094, China, E-mail: wangkun@cau.edu.cn

**Key words:** *Potentilla acaulis* population, desertification grassland, agro-pastoral ecotone, quantitative characteristics, clone plant

**Introduction** *Potentilla acaulis* is a typical perennial clone plant in desertification grassland of Northern China and it has a strong adaptability to sanded soil, which is always the last existent plant population in the process of grassland desertification (Wang and Li, 1999). Quantitative characteristics of *Potentilla acaulis* population were used to evaluate vegetative adaptive strategies to habitats in this study.

**Materials and methods** Three typical sample regions were selected and set up in northern of Hebei province in accordance with vegetation, soil and meteorology properties (data not shown), which separately presented the light, medium and heavy desertification degree of grassland. 30 replicated *Potentilla acaulis* tufts (60cm < diameter size < 80cm) were randomly selected in every experiment region. In each replicated dose, the above-ground and below-ground biomass of 15 cm × 15 cm quadrat was collected in 5 incessantly months of growing period. The roots, stems and leaves of plant tufts were separately treated with suitable methods. The data were analyzed by SPSS13.0.

**Results** During all the growing periods, the below-ground biomass of heavy degree region was the lowest level of the three sample regions (Figure 1). This was demonstrated that the desertification degree of grassland was the crucial factor that effected on the below-ground biomass of *Potentilla acaulis* population. With the desertification strengthened, the ratio of above-ground to below-ground biomass was increased, which showed *Potentilla acaulis* population distributed more nutrients to the above-ground. Specific leaf area, leaf longevity and specific stolon internode weight of *Potentilla acaulis* population were obviously affected by desertification degree of grassland (Table 1).



**Figure 1** Above/below-biomass of *Potentilla acaulis* population under various desertification degree in 2007. Data of biomass is dry weight of 15 × 15 cm quadrat.

**Table 1** Specific leaf area, leaf longevity and specific stolon internode weight of *Potentilla acaulis* population in different desertification degree.

Treatment	Light	Medium	Heavy
Specific leaf area (cm <sup>2</sup> /g.dw)	389.18 <sup>c</sup>	263.82 <sup>b</sup>	182.79 <sup>a</sup>
Leaf longevity (day)	27 <sup>ab</sup>	65 <sup>c</sup>	22 <sup>a</sup>
Specific stolon internode weight (mg/cm)	2.42 <sup>a</sup>	4.81 <sup>b</sup>	6.25 <sup>c</sup>

**Conclusions** Different desertification degrees of grassland caused changes of biomass allocation and modules of *Potentilla acaulis* population. Fast-growth of leaves and adventitious roots were the growing strategy of *Potentilla acaulis* population responding to desertification grassland.

### Reference

Wang S.P. and Li Y.H. (1999). Degradation mechanism of typical grassland in Inner Mongolia. *Chinese Journal of Applied Ecology*, 10, 437-441.