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## Strategy of reproductive allocation of *Stellera chamaejasme* population

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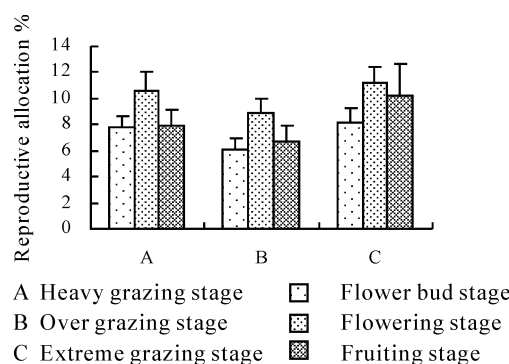
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**Key words:** *Stellera chamaejasme* population, reproductive age, reproductive allocation, module

**Introduction** Reproductive allocation (RA) is the ratio of assimilation products distributed in reproductive organs during plant growth and development, i.e. the amount of organics distributed in reproductive organs. RA controls the balance between a plant's reproduction and survival. *Stellera chamaejasme* L. is a major poisonous plant in the grasslands of China. With grassland degrading, the plant's distributed areas are increasing, harming animal production. We estimated RA and analyzed the relationships between RA and age to offer a theoretical basis for effective control of dispersal.

**Study sites and methods** The study area was located in the western part of a residential station in Daodesumu village, Inner Mongolia, China ( $120^{\circ}24'-120^{\circ}25'E$ ,  $43^{\circ}42'-43^{\circ}43'N$ ). The climate in the study area is temperate continental monsoon. The annual average temperature is  $6^{\circ}C$  and the annual precipitation is 300 mm. Three study sites were selected and classified into heavy grazing stage (HGS), over-grazing stage (OGS), and extreme grazing stage (EGS) (Xing, 2001). In June 2001, *S. chamaejasme* individuals were randomly sampled in a  $1\text{ m}\times 1\text{ m}$  plot in each of the three sites; there were 30-40 plots in each site. The stems, leaves, buds, flowers, and fruits were separated and weighed after being dried at  $80^{\circ}C$ . The method of identifying the individual age was based on the morphological characteristics (Xing, 2004). The RA is a ratio of standing crop of reproductive modules to total aboveground biomass. Analysis of variance was used to test differences among each mean RA from the three sites.

**Results** RA values of flower bud, flowering, and fruiting stage were lowest at OGS compared with those at HGS and EGS (Figure 1). The differences of RA in during flowering bud and fruiting stage were not significant among the three grazing stages. However, the difference of RA in flowering stage was significant ( $F=4.961$ ,  $p<0.01$ ) between OGS and EGS. Therefore, differences of RA pattern at the three sites were minimal. At the same grazing stage, RA value in flowering stage was higher than that in flower bud stage and fruiting stage. The results showed that the means of total stems, leaves, and reproductive module (RM) at the three grazing stages were 42.30%, 49.08%, and 8.62%, respectively, i.e. Stem : Leaf : RM = 5 : 6 : 1.



**Figure 1** Reproductive allocation of *S. chamaejasme* population in different grazing stages.

**Conclusions** The RA of *S. chamaejasme* population was relatively stable in different grazing stages. RA pattern of the plant was probably determined by its genetic characteristics, and not greatly disrupted by grazing. The largest part of aboveground biomass was invested in leaves, the second largest in stems. Our results showed that one of the resource allocation strategies of *S. chamaejasme* is to use resources for vegetative growth rather than reproductive growth.

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