Strategy of Reproductive Allocation of *Stellera chamae jasme* Population

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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°24′-120°25′E , 43°42′-43°43′N) . The climate in the study area is temperate continental monsoon . The annual average temperature is 6℃ 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 m×1 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℃ . 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 .

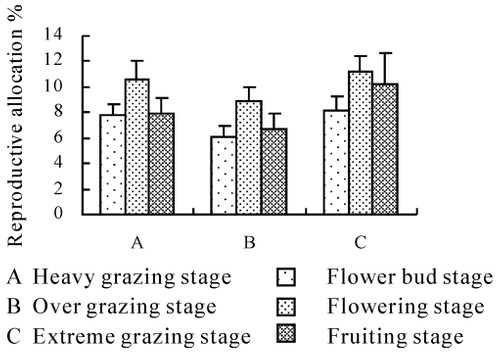

Figure 1 *Reproductive allocation of* S . chamaejasme *population in different grazing stages .*

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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