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Shengyao Wang

Agricultural University of China, China

Kun Wang

Agricultural University of China, China

Yonglai Zh.

The General Grassland Station of Qinghai Province, China

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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Effect of Oxytropis species consumption on sheep forage preference in northeastern Qing-tibetan Plateau

ShengY . W .^{1,2} , Kun W .¹ , Yong-lai . ZH .²

¹The institute of grassland research of animal scientific college of Agricultural university of China ,NO .2 Yuanmingyuan western road , Beijing , China 100094 . E-mail address : Wangshyao8@163 .com ; wangkun@cau .edu .cn

²The general station of grassland of Qinghai Province ,NO .73 Victory street , Xining , Qinghai province in China 810008

Key words : poisonous plants , *O .K .B* , sheep , forage preferring

Introduction Poisonous Oxytropis species are the most widespread and most harmful poisonous plants in the plateau . Specially , *O .K .B* is regarded as the typical plateau species by many researchers because of being confined in the plateau (ZHAOYI-Zhi 1992) . Oxytropis species poisoning causes neurological disturbances affecting appetite (SHIZHI-Cheng 1996) . The aim of this study was to determine the amount of *O .K .B* consumed by sheep through the spring and into the early summer , as other forage progressed from breaking dormancy to rapid growth . Our second objective was to compare the amount of *O .K .B* consumption between the sheep with a history of eating Oxytropis and the group not eating , then to determine if the former would prefer the forage .

Materials and methods Thirty 3 years old Tibetan sheep were purchased from a farm with histories of *O .K .B* poisoning issues , including 13 sheep with a record of not-eating *O .K .B* . and the rest with histories of eating *O .K .B* . The sheep were adapted to the confined yard , and diets were quantified by bites being video-recorded for 2 to 4 .5 min periods during each morning and evening . Number of bites taken of each plant species was counted . Species were grouped into major forage classes (Cyperaceae , grasses , forb , and edible legumes) . Standing crops of forage classes were sampled at each location at the beginning and end of the study in ten 0 .25 by 0.25 m² quadrats per sample , Other forage was clipped , dried in a forced air dryer at 60°C for 48 hours , and weighed . The Oxytropis species were collected at 3 growth stages (vegetative , flower , and pod) to determine the content levels of the toxic alkaloid swainsonine , measured by gas chromatography (Michael H .1993) and expressed as percentage of dry matter .

O .K .B consumption was evaluated in 3 grazing periods in sequence to the vegetative , flowering and pod stage of development . Treatment groups consisted of oxytropis-eater and non-eaters described above . Data from the trial were analyzed separately by analysis of variance (ANOVA) in a split-plot repeated measures design (Gill 1978) .

Results *O .K .B* consumption did not differ between eaters and non-eaters in any of the periods or grazing trials ($p > 0 .05$) .

O .K .B was not consumed at the beginning of the trial at period 1 ; it increased to 66% of the diets at mid trial or period 2 ; and then leveled off at about 45% at the beginning of period 3 . The increased availability and improved nutrient quality of grasses and forbs and maturation of *O .K .B* influenced sheep to stop grazing *O .K .B* . Higher concentrations of swainsonine occurs in the flower stage and pod stage in phenology than in the vegetative stage .

Conclusions Sheep initially refused to eat *O .K .B* even with extreme grazing conditions . However , once they were forced to start eating , they continued to consume *O .K .B* for a certain period . Once growth of grasses started and green grass became abundant , all sheep , including the oxytropis eaters , ceased grazing *O .K .B* . Spring is a critical time for oxytropis consumption and subsequent poisoning . Once green grass becomes abundant , oxytropis consumption is no longer a problem .

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