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A preliminary study of the diurnal dynamics of photosynthetic rate of three grasses

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Key words : *Hodeum brevisubulatum*, *Roegneria turczaninovii*, *Elymus nutans*, the diurnal dynamics of photosynthetic rate, preliminary study

Introduction Herbs Grass has been widely used in grassland ecology construction in China. There are more studies on herbs grass adaptability and productivity. However, there is a lack of information about grass photo—physiology characteristic. The objective of this paper is to compare the diurnal dynamics of photosynthetic rate (Pn) and transpiration rate (Tr) among *Hodeum brevisubulatum*, *Roegneria turczaninovii* and *Elymus nutans* to further understand the photosynthetic characteristics of three grasses.

Materials and methods The experiment was carried out in August, 2007 in Inner Mongolia. The Li-6400 was used to measure the Pn and Tr of two years planted grasses (*Hodeum brevisubulatum*, *Roegneria turczaninovii* and *Elymus nutans*) during fructification. The leaf samples were tested every two hours from 8:00 a.m. to 18:00 a.m. on sunny, and repeated 3 times in each experiment. 3 leaves of each plant were selected in measurement.

Result Seen Figure 1 know, Pn of three grasses exhibited a twin-peaked pattern. The first apex of *Hodeum brevisubulatum* and *Roegneria turczaninovii* appeared at 8:00, while that of *Elymus nutans* appeared at 11:00. The second apex of *Hodeum brevisubulatum*, *Roegneria turczaninovii* and *Elymus nutans* appeared at 14:00, 18:00 and 16:00 respectively; There was noon depression of photosynthesis for *Hodeum brevisubulatum* at 12:00. Noon depression of photosynthesis for *Roegneria turczaninovii* and *Elymus nutans* appeared 14:00. The diurnal dynamics of Tr was similar to that of Pn (Figure 2).

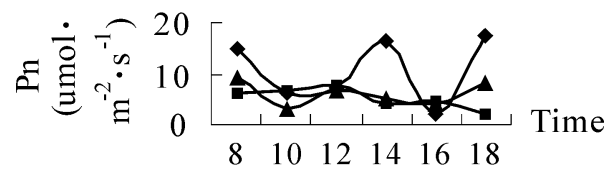


Figure 1 Diurnal changes of the net photosynthesis rate of three grasses.

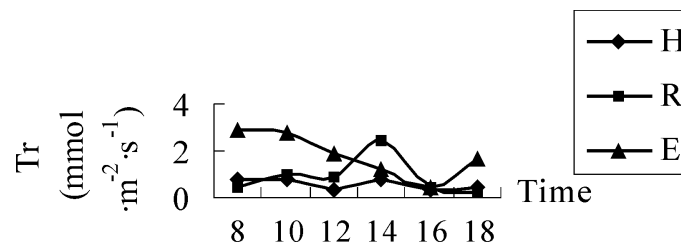


Figure 2 Diurnal changes of the transpiration rate of three grasses.

H : *Hodeum brevisubulatum* ; R : *Roegneria turczaninovii* ; E : *Elymus nutans*

Conclusions Pn of the three grasses exhibited a twin-peaked pattern. There was noon depression of photosynthesis for three grasses. With PAR declining after 16:00 a.m., Pn and Tr of *Roegneria turczaninovii* fell rapidly, while Pn and Tr of *Hodeum brevisubulatum* and *Elymus nutans* rose tardily. This indicated that *Hodeum brevisubulatum* and *Elymus nutans* may be good for using the sunlight of sunset.

Reference

HE W-X., YI J. & LI H-M., (2004). Comparative study on daily change of photosynthesis rate of rhizomatous grasses in milky ripe stage. *Chinese Journal of Applied Ecology* 15, 205-209.