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Effects on bird cherry-oat aphid resistance to drunken horse grass by *Neotyphodium* endophyte infection

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Key words: *Achnatherum inebrians*, *Neotyphodium gansuense*, *Rhopalosiphum padi*, tolerance

Introduction Drunken horse grass (*Achnatherum inebrians*) is a perennial bunchgrass, which is so named because it is associated with narcosis of horses grazing on this grass. *A. inebrians* is mainly distributed on alpine and subalpine grasslands in Gansu, Xinjiang, Qinghai and Inner Mongolia of northern China (Li *et al.*, 2004ab). Endophyte infected *A. inebrians* has been shown to contain high levels of the ergot alkaloids, ergonovine and lysergic acid amine (Miles *et al.*, 1996; Li *et al.*, 2006). There was only one primary report on pests, drunken horse grass and endophyte (Li *et al.*, 2007).

Materials and methods *A. inebrians* seeds were collected from Yuzhong, Gansu, China. Endophyte infected (E+) and non-infected (E-) plants of *A. inebrians* were grown in plastic pots. Ten adults of bird cherry-oat aphid (*Rhopalosiphum padi*) were inoculated onto 2-week-old E+ and E- plants covered with fiberglass window screen, kept in a room at 20°C with 16h light and 8 h dark cycle. Numbers of aphids were recorded weekly.

Results After inoculation, aphid numbers on E+ plants were significantly ($p < 0.05$) lower than that on E- plants by 69.7~100%. Regardless of endophyte status, aphid number on plants increased at 1st 2 weeks and significantly ($p < 0.05$) decreased in the following weeks. On E+ plants, there was only a few and no aphid surviving in 6th and 7th week, respectively. Aphid feeding has been deterred by endophyte infection. Plant became yellow, even withered on E-leaves. (Table)

Table Survivor of aphids after released on E+ and E- plants of *Achnatherum inebrians*.

Week No.	1	2	3	4	5	6	7
E+	37±2.1ab	66±4.8a	46±3.9a	21±2.3c	8±1.73d	0.6±0.1d	0±0d
E-	129±5.3*bc	233±9.3*a	152±8.6*b	106±7.7*c	68±9.7*d	43±6.9*e	19±2.5*f
Decreased %	71.3	71.7	69.7	80.2	88.2	98.6	100.0

Notes: In same column, asterisk means significant difference between E+ and E- ($p < 0.05$). In same row, different letters mean significant difference ($p < 0.05$).

Conclusions

1. *Neotyphodium* infection could significantly ($p < 0.05$) reduce numbers of *R. padi* on E+ *A. inebrians* compared to E- plants.
2. Endophyte infection could delay leaf yellowing and plant death or damage by aphid.

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