

生化他感作用与高寒草甸上人工草场自然退化现象研究：
II. 垂穗托碱草 (*Elymus nutans*) 与细叶亚菊 (*Ajania tenuifolia*)
种子萌发过程中的植物种内及种间生他感现象实验观察

张宝琛 白雪芳 顾立华 甄润德

STUDIES ON THE ALLELOPATHY IN THE NATURAL
DEGENERATED PROCESS OF MAN-MADE GRASSLAND
ON ALPINE MEADOW: II.
THE INVESTIGATION OF INTRASPECIFIC AND INTERSPECIFIC
ALLELOINHIBITORY PHENOMENA DURING GERMINATION
OF *ELYMUS NUTANS* AND *AJANIA TENUIFOLIA* SEEDS

Zhang Baochen Bai Xuefang Gu Lihua Zhen Runde

(Northwest Plateau Institute of Biology, Academia Sinica)

ABSTRACT

In order to prove the alleloinhibitory phenomena really exist in the natural degenerated process of man-made *Elymus nutans* grassland, germination experiments with different sowing density of *E. nutans* seeds and mixed germination experiments of *E. nutans* with different amounts of *Ajania tenuifolia* seeds were done by sowing in petri dishes ($c=11.2$ cm) for nine days. The experimental results are the following:

1. In the germination experiments with different sowing densities of *Elymus nutans* seeds, the germination and seedling growth were not inhibited when the density was under 0.4 g/p.d., but compared with control, the germination rate of seeds was inhibited by 34.9% ($p < 0.01$ by t-test) and the germination time of 50% seeds was delayed by 20 hours when the density was 0.6 g/p.d.. The seedling height and root length were reduced by 14 mm and 2.5 mm separately ($p < 0.01$ by t-test) when the density was 0.8 g/p.d.

2. In the mixed germination experiments of 0.2 g/p.d. *E. nutans* seeds with different amounts of *Ajania tenuifolia* seeds, We found that germination of *Elymus nutans* seeds was not influenced, but the growth of seedling was stimulated when the mixed amount of *Ajania tenuifolia* seeds was under 0.05 g/p.d. However it showed strong inhibitory effect on seeds germination and seedling growth of *Elymus nutans* when the mixed amount of *Ajania tenuifolia* seeds was over 0.1 g/p.d.. Compared with control, the germination rate of *Elymus nutans* seeds was reduced by 32.8%, their seedling height and root length were reduced by 10.9 mm and 4.5 mm respectively ($p < 0.001$ by t-test) when the mixed volume of *Ajania tenuifolia* seeds was 0.1 g/p.d.

3. Considering all the necessary condition for *Elymus nutans* seeds germination were satisfied, the inhibition of seed germination and seedling growth of *Elymus nutans* in both experiments showed that there were intraspecific alleloinhibitory action during the course of seeds germination of *E. nutans* and interspecific alleloinhibitory action between *Ajania tenuifolia* and *Elymus nutans*.