

# 镉对不同品种苜蓿种子萌发及幼苗生长的影响

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**摘要** 通过培养皿滤纸萌发实验,研究了不同 Cd<sup>2+</sup> 浓度(0、5、10、20、50、100、200 mg·L<sup>-1</sup>)对7种苜蓿种子萌发和幼苗生长的影响。结果表明,5~20 mg·L<sup>-1</sup>的 Cd<sup>2+</sup> 处理对不同品种苜蓿的萌发指标有不同程度的促进效应,10 mg·L<sup>-1</sup>的处理显著增加了甘农1号和阿尔冈金的鲜重。Cd<sup>2+</sup> 对不同品种苜蓿萌发指标的抑制效应差异较大: Cd<sup>2+</sup> 浓度5~200、20~200、50~200和200 mg·L<sup>-1</sup>的处理分别显著降低了皇后、牧歌、中兰1号和中兰2号的发芽势; 50~200、100~200和200 mg·L<sup>-1</sup>的处理分别显著降低了中兰1号、牧歌(阿爾岡金)及中兰2号(皇后)的发芽率; 50~200、100~200和200 mg·L<sup>-1</sup>的处理分别显著降低了中兰1号、牧歌(阿爾岡金)和中兰2号(皇后)的发芽指数; 20~200 mg·L<sup>-1</sup>的处理均显著降低了所有品种苜蓿的活力指数; 50~200 mg·L<sup>-1</sup>的处理均显著降低所有品种的鲜重,不同 Cd<sup>2+</sup> 浓度对7种苜蓿的根长和/或芽长均有显著抑制效应。所有萌发指标中,发芽率、发芽指数和鲜重与 Cd<sup>2+</sup> 浓度之间的 Pearson 相关性达到极显著水平, Cd 浓度的变化对这些指标变化的解释量均超过 83%。利用隶属函数值综合评价7种苜蓿对 Cd<sup>2+</sup> 的耐受性,皇后以其高的发芽率及 Cd<sup>2+</sup> 耐受性,可作为修复重金属污染土壤的优推品种。

**关键词** 镉; 苜蓿; 萌发; 幼苗生长

**Effects of cadmium on seed germination and seedling growth of different alfalfa varieties.**

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**Abstract:** The effects of Cd<sup>2+</sup> with different concentrations (0, 5, 10, 20, 50, 100, 200 mg·L<sup>-1</sup>) on seed germination and seedling growth of seven alfalfa varieties were examined in a germination experiment with Petri dish filter paper. The results showed that germination indices of different alfalfa varieties were promoted by different extents with Cd<sup>2+</sup> treatments in the range of 5–20 mg·L<sup>-1</sup>. The fresh weight of Gannong No. 1 and Algonquin was significantly increased under 10 mg·L<sup>-1</sup> treatment. The inhibiting effects of Cd<sup>2+</sup> treatments on the examined indices of different alfalfa varieties were greatly different. The germination potential of Empress, Amerigrage, Zhonglan No. 1 and Zhonglan No. 2 was significantly decreased under 5–200, 20–200, 50–200 and 200 mg·L<sup>-1</sup> treatments, respectively. The germination rates and germination indices of Zhonglan No. 1, Algonquin (Amerigrage), and Zhonglan No. 2 (Empress) were significantly reduced under treatments with Cd<sup>2+</sup> concentration of 50–200, 100–200 and 200 mg·L<sup>-1</sup>, respectively. Cd<sup>2+</sup> concentration of 20–200 mg·L<sup>-1</sup> significantly decreased vigor index of all varieties. Fresh weight of all varieties significantly were decreased under treatments with Cd<sup>2+</sup> concentrations of 50–200 mg·L<sup>-1</sup>. All Cd<sup>2+</sup> treatments significantly inhibited root and/or bud length of seven varieties. The correlations between germination rate, germination index, fresh

国家重点研发计划项目课题(2017YFD0801502)、国家自然科学基金项目(41807334)和农业部环境保护科研监测所基本科研业务费专项(2019-jbkyywf-bql)资助。

收稿日期: 2019-09-03 接受日期: 2020-01-08

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