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## Effects of cobalt treatment on growth of five legume species

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**Key words** Cobalt ,Legume species ,Pot experiment ,Growth ,Biological indexes .

**Introduction** Cobalt is one of the elements of vitamin B<sub>12</sub> , which is important to animals and human beings . For some legume species , cobalt could promote the ability to fix nitrogen , increase the amount of root nodules , plus it could increase the content of nitrogen and phosphorus as well as the yield of seeds .

**Materials and methods** The materials are five common legume species , *Medicago sativa* , *Trifolium repens* , *Lespedeza bicolor* , *Lotus corniculatus* , *Astragalus adsurgens* . The effects of cobalt treatment on five legume species were studied in a pot experiment . First , young plants were grown in experiment dishes , then moved to the experimental pots which were treated with CoCl<sub>2</sub> · 6H<sub>2</sub>O . The levels of Co were : 0 , 50 , 100 , 200 , 300 , 500 , 700 mg .kg<sup>-1</sup> . Physiological and biological indexes were measured after 30-day treatment .

**Results** With 50 mg .kg<sup>-1</sup> , the values of plant height , biomass and photosynthetic rates were higher than CK's (CK refer to the 0 mg .kg<sup>-1</sup> Co treatment) while the values of plasmalemma permeability , soluble sugar content , MDA content and activities of CAT were lower than CK's . The effects of 100 mg .kg<sup>-1</sup> treatment were indefinite for some index values are higher than CK's , some are not . Say treatment of 200 mg .kg<sup>-1</sup> , the values of plant height , biomass and photosynthetic rate are lower than CK's in relation to the values of relative plasmalemma permeability , soluble sugar content , MDA content and activities of CAT are higher than CK's . When the treatment concentration come to above 200 mg .kg<sup>-1</sup> , the values of plant height , biomass and photosynthetic rate are continue decreasing , correspondingly , the values of plasmalemma permeability , soluble sugar content , MDA content and activities of CAT continue rising .

**Conclusions** The 100 mg .kg<sup>-1</sup> Co treatment promotes the growth of all five materials , while the effects of 100 mg .kg<sup>-1</sup> treatment did not show significant differences from CK's . The treatment of 200 mg .kg<sup>-1</sup> and above restricted the growth of the five materials , and the higher the treatment concentration , the more suppressive was the effects of the treatment .

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