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## Effect of NaCl on seed germination and seedling growth of *Medicago falcata* L .

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**Key words** : alfalfa , germination index , recovery , germination

**Introduction** Songnen grassland is located in north-east of China and is widely salt affected . Introducing salt-tolerant legume species is important to improve feed quality and increase soil nitrogen in Songnen grassland . This study aims to evaluate salt tolerance of species *Medicago falcata* which has the potential to be introduced to Songnen grassland . The effect of salt stress on germination and recovery of *Medicago falcata* was tested .

**Materials and methods** Seeds of *Medicago falcata* and two cultivars ( as control ) ( CW400 and Gongnong 2 ) of *Medicago sativa* were germinated at 11 NaCl concentrations ( 0 , 20 , 40 , 60 , 80 , 100 , 120 , 140 , 160 , 180 , 200 mmol/L ) with a temperature of  $20\pm 2^{\circ}\text{C}$  and a photoperiod of 12 hour . Ungerminated seeds were transferred to distilled water to study the recovery of germination .

**Results** The results showed that the germination percentage decreased with increasing NaCl concentration . However , the total germination , which included the germination of recovery seeds , for the three cultivars had no significant differences . ( Table 1 ) .

**Table 1** Recovery germination percentage ( RGP ) and the total germination percentage ( TGP ) for the three cultivars . Different letters indicate significant difference between cultivars at the same NaCl level (  $P < 0.01$  ) .

	CW400		Gongnong 2		<i>M. falcata</i>	
	RGP	TGP	RGP	TGP	RGP	TGP
0	—	92.1±2.86 <sup>A</sup>	—	98.0±1.97 <sup>A</sup>	—	92.2±1.1 <sup>A</sup>
20	—	95.3±3.16 <sup>A</sup>	—	87.9±3.72 <sup>AB</sup>	—	93.3±3.84 <sup>A</sup>
40	11.1±11.1 <sup>AC</sup>	94.1±2.4 <sup>A</sup>	44.4±29.39 <sup>A</sup>	95.8±3.00 <sup>A</sup>	82.8±9.63 <sup>A</sup>	97.8±1.1 <sup>A</sup>
60	0.0±0.00 <sup>A</sup>	100±0.00 <sup>A</sup>	35.6±19.38 <sup>A</sup>	88.4±4.49 <sup>AB</sup>	97.9±2.08 <sup>A</sup>	100±0.00 <sup>A</sup>
80	33.3±16.67 <sup>ABC</sup>	93.2±3.48 <sup>A</sup>	36.7±18.57 <sup>A</sup>	84.6±3.77 <sup>AB</sup>	100.0±0.00 <sup>A</sup>	97.7±1.15 <sup>A</sup>
100	26.7±26.67 <sup>ABC</sup>	95.5±1.11 <sup>A</sup>	62.4±11.11 <sup>A</sup>	84.7±6.45 <sup>AB</sup>	97.0±1.52 <sup>A</sup>	97.8±2.23 <sup>A</sup>
120	33.3±16.67 <sup>ABC</sup>	95.5±2.94 <sup>A</sup>	59.4±13.81 <sup>A</sup>	89.8±2.61 <sup>AB</sup>	96.9±1.55 <sup>A</sup>	97.7±1.17 <sup>A</sup>
140	51.8±1.86 <sup>C</sup>	94.2±2.1 <sup>A</sup>	87.3±6.91 <sup>A</sup>	93.2±3.45 <sup>AB</sup>	98.9±1.15 <sup>A</sup>	96.7±3.33 <sup>A</sup>
160	75.3±6.8 <sup>BC</sup>	93.3±1.93 <sup>A</sup>	81.9±2.15 <sup>A</sup>	89.1±0.83 <sup>AB</sup>	98.7±1.28 <sup>A</sup>	94.5±2.23 <sup>A</sup>
180	69.0±9.36 <sup>BC</sup>	87.8±7.79 <sup>A</sup>	86.4±4.73 <sup>A</sup>	88.4±4.52 <sup>AB</sup>	98.9±1.15 <sup>A</sup>	98.9±1.1 <sup>A</sup>
200	80.4±1.6 <sup>BC</sup>	89.6±2.19 <sup>A</sup>	79.5±3.81 <sup>A</sup>	79.1±2.79 <sup>B</sup>	97.7±2.30 <sup>A</sup>	97.8±2.23 <sup>A</sup>

**Conclusions** Compared to the two cultivars of *M. sativa* , seeds of *M. falcata* can survive better at high NaCl concentrations as indicated by the higher recovery percentage . This suggests that *M. falcata* is more salt tolerant than *M. sativa* and should be preferred over *M. sativa* in Songnen grassland .

### Reference

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