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Effects of polyethylene glycol (PEG)-simulated drought stress on *Chamecytismus palmensis* seed germination

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Key words : Polyethylene glycol, *Chamecytismus palmensis* seeds, water stress, germination rate, germination potential

Introduction *Chamecytismus palmensis* is a high-quality resource in arid or semi-arid regions. Much work has been done on the characteristics of seed germination of *Chamecytismus palmensis* seeds, but few studies have compared germination of seeds collected in the same region on different habitats. Thus, this study investigated germination of *Chamecytismus palmensis* seeds with simulated drought stress. These data should aid in selecting drought tolerant species for arid and semi-arid regions.

Materials and methods A total of four kinds of stress were planned with polyethylene glycol PEG(6000) concentrations of 100, 150, 200 and 300 g·L⁻¹. These corresponded to the water potentials of about -0.20, -0.40, -0.60 and -1.20 MPa (Bailey J D, 2002). Seeds were placed on filter paper in Petri dishes immersed in PEG solutions. Temperature was controlled at 20~22°C and light was provided 12 hours a day (test room, natural light scattering). A few drops of PEG solution were added onto the filter paper everyday and papers were changed every 2d (Ungar J.A, 1982). Distilled water was used as CK. Each concentration gradient included 5 replications, each replication contained 50 seeds.

Results Compared with CK, the rate of seed germination in 10% PEG concentration only decreased 8%, while 15% and 20% PEG concentration decreased the rate 24% and 34%, respectively. No germination occurred in 30% PEG. As the stress level increased, seed germination potential of *Chamecytismus palmensis* decreased significantly. Indicating that with PEG simulated drought stress, seed germination potential declined. Seeds germination potential declined significantly in 10% PEG. The decline for 20% PEG was significant at P=0.05. Research showed the germination potential was more sensitive to drought stress than the germination rate.

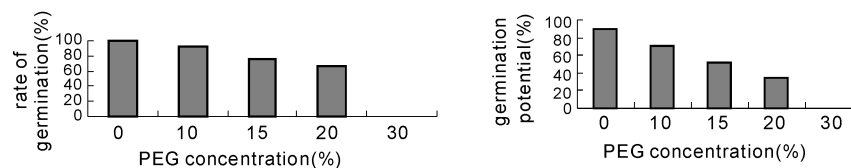


Chart 1 the effect of PEG simulated water stress on germination rate and the germination potential of *Chamecytismus palmensis* seeds.

Conclusions PEG retarded the germination of seeds, and the germination rate and germination potential decreased with increasing PEG concentration. The seeds treated with 30% PEG (about -1.2MPa water potential) did not germinate at all, suggesting that 30% PEG was the threshold for the germination of *Chamecytismus palmensis* seeds.

References

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