

3 - 38 Effects of Carbon Ion Beam Irradiation on Germination and Seedling Growth of *Suaeda salsa* L.

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As a typical halophyte which indicates saline soil, *Suaeda salsa* L. with ability of salt collection can be used as a pioneer plant to improve the saline-alkali land. Halophytes play an important role in the salty soil bioremediation, and have ecological and potential economic value. Therefore, it turned into a domestication object of the world's scientific research and production experiment.

Radiation mutagenesis techniques are used for plant breeding to increase the mutation rate and improve the efficiency of plant breeding. Therefore, it is very necessary to select the appropriate dose of radiation. The 80 MeV/u $^{12}\text{C}^{6+}$ ion beams were provided by heavy-ion accelerator in Lanzhou IMP. Different doses including 0, 80, 160, 240, 320 and 480 Gy were used to treat dry seeds of *Suaeda salsa* L. The biological characteristics including seed germination rate, seedling plant height, root length, seedling fresh weight and survival rate were investigated.

As shown in Fig. 1, seed germination rate was increased significantly with the increase of irradiation dose, and irradiated seeds were significant higher than that of control group ($P < 0.05$). Seedling survival rate and fresh weight were dropped significantly with the increase of irradiation dose, and it showed significant inhibitory effect ($P < 0.05$) when the irradiation dose was up to 80 Gy. Similarly, seedling height and root length increased was dropped significantly with the increase of irradiation dose, and it showed significant inhibitory effect ($P < 0.01$) when the irradiation dose was up to 160 Gy.

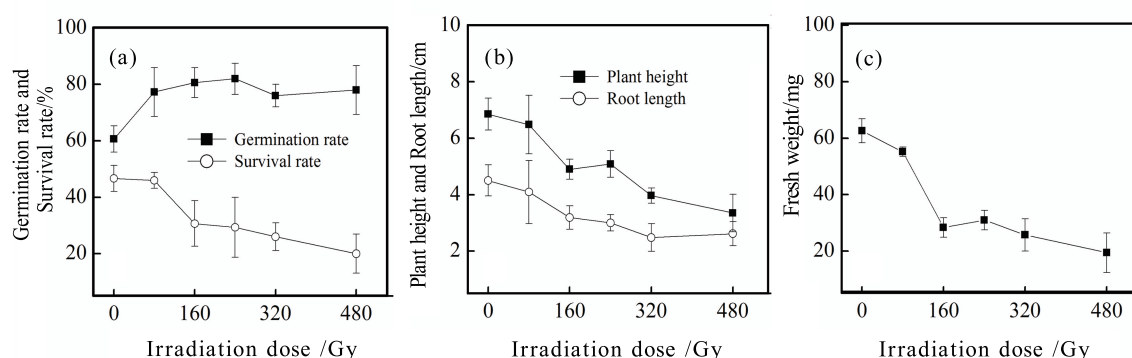


Fig. 1 (color online) Effects of Carbon ions beam irradiation on *Suaeda salsa* L. germination and seedling growth.

Results showed that carbon ions beam irradiation had a promoting effect on seed germination rate of *Suaeda salsa* L., and also had inhibiting effect to plant growth and seedling survival. The medial lethal dose of *Suaeda salsa* L. was 364 Gy and the optimum irradiation dosage was 291~437 Gy.