3 - 42  Dose Rate Effects of Carbon Ions Irradiation on Root Growth of Arabidopsis thaliana

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The height of Arabidopsis thaliana is relatively short, almost 30 cm high, and its life cycle nearly 3 months. So Arabidopsis thaliana is a suitable material for plant radiation research. Heavy ion beams are widely used in plant breeding as a novel physical mutagen[1]. In this study, dry seeds of Arabidopsis thaliana (ecotype Columbia) were arranged in a single layer and packaged by parafilm. Samples were irradiated by carbon ion beams accelerated by Heavy Ion Research Facility in Lanzhou (HIRFL) with different dose rates (0, 8, 40, 80 Gy/min). Doses of 50 and 100 Gy were applied in this study.

![Fig. 1 The phenotypes of root length effected by carbon ion beam irradiations with different dose rate.](image)

Irradiated dry seeds were sown on MS medium, and all the plants were grown in the culture rooms with the condition of 22 °C and under 18h-light/6h-dark cycle. Image J software was used to measure the length of roots from the digital photos taken on the 7th day after sowing.

Fig. 1 shows that root length of unirradiated control were longer than those upon irradiation. The morphology of roots of irradiated samples were curved. Further analysis by Image J shown in Fig. 2 demonstrated that the root length of samples irradiated by 100 Gy is shorter than 50 Gy. However, the root length of Arabidopsis irradiated by different dose rate with the same dose did not have significant difference using SPSS statistics analysis.

![Fig. 2 effects on root length of Arabidopsis.](image)

Reference