

EFFECT OF RADIATION SPECTRAL COMPOSITION ON GERMINATION AND GROWTH OF CHESTNUT *IN VITRO*

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ABSTRACT

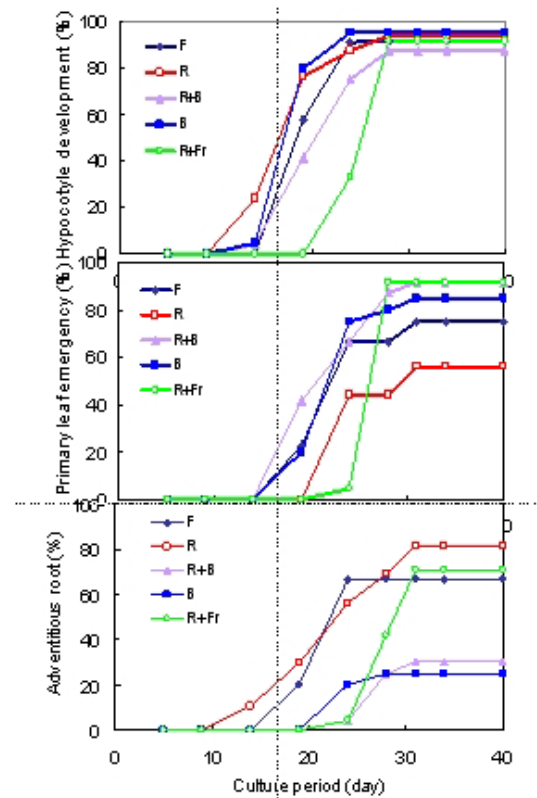


Fig. 1. Developmental characteristics of zygotic embryos under different spectral radiations during entire culture period in chestnut.

Among environmental conditions in micropropagation, light quality plays an important role in growth, specially morphogenesis and photosynthesis. The effect of radiation quality (350 - 740 nm) on development and growth of zygotic embryos and *in vitro* plantlets of open-pollinated Japanese chestnut (*Castanea crenata* S. et Z.) was studied. Two types of explants were exposed for four weeks to cool white (W, as control), monochromatic red (R, peak emission 650 nm), monochromatic blue (B, peak emission 440 nm), red+blue (R+B, 1:1) and red+far-red (R+Fr, 1:1, far-red peak emission 720 nm) radiation from light-emitting-diodes (LED) system. While zygotic embryo showed positive photoblastic behaviour, its germination was inhibited under blue radiation (Fig. 1). Both the hypocotyl elongation and root development were positively correlated with red radiation. The emergence of primary leaf and its expansion were faster in blue than red condition (Fig. 2). In plantlet explant, red and red+far-red radiation significantly increased formation and growth of root, whereas blue light reduced rooting (Fig. 3). Therefore, radiation quality appears to influence some steps in the development of zygotic embryos and plantlets in chestnut.

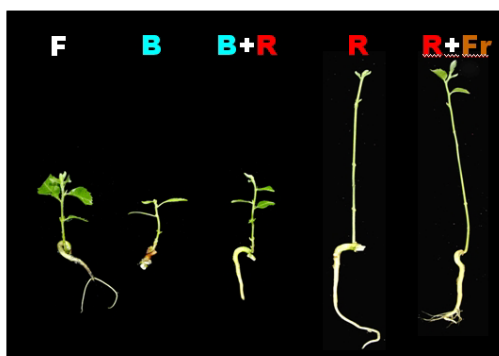


Fig. 2. Development of chestnut zygotic embryos under different spectral radiation.



Fig. 3. Growth of *in vitro* chestnut plantlets under different spectral radiations for 8 weeks.

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