

(W-II-1) :

EFFICIENT REGENERATION METHODS IN VEGETABLE PLANTS

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Shoot induction techniques by plant tissue cultures are useful procedures for propagation of important plants and production of transgenic plants. In *in vitro* organogenesis, there are interactions between three factors: medium, culture condition, and explant. Organogenesis through empirical studies of the interactions of the above factors is known well, and presently several thousand plant species have been reported to form shoots *in vitro*. Organogenesis in seed plants has almost been achieved by using excised cotyledons and hypocotyls of seedlings, which are young tissues of the early stages of zygotic embryo development. However, organogenesis in some plant species has rarely occurred although their hypocotyls and cotyledons have high organogenesis competency. Efficient and reproducible organogenesis systems are required for studying basic research and for applying to commercial production. We have established a method for high frequency shoot production via organogenesis in plants. Shoots of *Allium fistulosum* developed from the surface on the ovaries on MS medium containing 0.5 mg/L BAP and 0.5 mg/L NAA. Shoots of *cucumis sativus* were formed directly on the seedling tissues cultured on MS medium containing 2.0 mg/L zeatin. When seedlings in other plants such as melon, pepper, *Lycium chinense*, allium, radish and French bean were cultured as described above with modified culture conditions, shoots were easily induced and were developed into morphologically normal plants.

(W-II-2) :

PROPAGATION OF *Panax ginseng* VIA SOMATIC EMBRYOGENESIS, ADVENTITIOUS SHOOT FORMATION, AND EPICOTYL-LIKE SHOOT FORMATION

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Korea ginseng plants (*Panax ginseng* C. A. Meyer) are perennial herbaceous medicinal plants. Cultivation is troublesome and a long time period (more than 3 years) is required for seed harvest. To induce germination the seeds require stratification and cold treatment for several months. Therefore plant tissue culture procedures is a valuable tool for the clonal propagation and genetic transformation of the ginseng plants. However, it has been accepted that regeneration of *P. ginseng* is a very recalcitrant process. Somatic embryogenesis from embryogenic callus culture is a well known way for ginseng plant regeneration, however, abnormal structures of somatic embryos were frequently formed, and plant conversion from those embryos is extremely low. We have established the several protocols of plant regeneration of *P. ginseng*: 1) plant regeneration via direct somatic