Induction of Shoot Regeneration from Various Explants in in vitro Culture of Hot Pepper (Capsicum annuum)

Edy Batara Mulia Siregar, Sri Ramadiana and Sudarsono

Molecular Biology Lab., Dept. of Agronomy, Faculty of Agriculture,
Bogor Agricultural University, Bogor, Indonesia

Attempt to regenerate shoots from various explants of hot pepper (Capsicum annum L.) has been conducted. Some degrees of success have been reported, although applicability of such reported techniques for different varieties require some testing. Since in vitro shoot regeneration is necessary for plant genetic transformation, it is important to solve such problem in shoot regeneration prior to genetic transformation of a certain Capsicum cultivar. This study was conducted to obtain conditions suitable for inducing in vitro shoot regeneration from explants of commercial varieties of hot pepper in Indonesia.

Five commercial hot pepper cultivars (cv. Hot beauty, Hot Spiral, Jatilaba, Laris, and Tit L Super) were used in the experiment. Explants (cotyledons, hypocotyls, and young leaves) were cultured on half strength MS medium containing various plant growth regulators (BAP at 0 to 8 mg/l; 2-iP at 0 to 2.5 mg/l; kinetin at 0 to 2.5 mg/l, with or without IAA at 0 to 2.0 mg/l). Cotyledons and hypocotyls were obtained from 14 days old germinated seedling while young leaves were taken from 25 to 30 days old seedlings. The cultures were incubated under 1500 to 2000 lux illumination, at 28/23°C day and night temperature regimes. Development of the explants were observed for a period of six months.

Results of the experiments indicated that in all conditions tested, shoot regeneration was obtained only at very low percentages. Some hot pepper cultivars were even failed to regenerate shoots. The development of the cultured explant was mostly the formation of callus, some roots, and very low percentage of shoots. Among three types of explant tested, cotyledons tended to exhibit the best results, followed by young leaf, and hypocotyls. BAP seemed to induce better shoot regeneration than kinetin or 2-iP. In some tissue culture media explants turned brown within a couple of weeks after culture.