ADVENTITIOUS SHOOT PROLIFERATION IN BEAN (PHASEOLUS SPP.)


*) Consorzio Agrital Ricerche, Viale dell'Industria 24, 00057 Maccarese (Roma)
**) Dipartimento di Agrobiologia e Agrochimica, Università degli Studi della Tuscia, Via S.C. de Lellis, 01100 Viterbo
soressi@unitus.it

in-vitro shoot proliferation, regeneration efficiency, bean, Phaseolus spp., biolistic transformation

Without considering its application potential, with no doubt the genetic transformation technique has to be considered a unique tool for advancing the basic plant knowledge. In the near future it is expected a more extensive application for the plant crops in which an efficient regeneration protocol be set up.

The species of the genus Phaseolus are considered recalcitrant to the in-vitro regeneration and therefore to the genetic transformation, thus depriving the basic research and the breeding of these leguminous plants of a precious tool.

The great effort carried out during the last 30 years by a number of experiments has not succeeded in setting up, particularly in Phaseolus vulgaris, a regeneration system efficient, reproducible, relatively simple and rapid.

Among the most interesting works, a relevant contribute was given by Angelini and Allavena (1989), who used cotyledons and immature embryos of P. coccineus, by Malik and Saxena (1991), with dry seeds, by Zambre et al. (2001), who regenerated and transformed via A. tumafaciens P. acutifolius and by Aragao et al. (1996) as to the P. vulgaris transformation through particle gun technique applied to apical meristems.

In the present paper, a ten-year data of research activity on P. coccineus (cv. Venere and SL770) and P. vulgaris (cv. Montecarlo) carried out at our lab are reported. The experiments aimed to set up protocols for adventitious shoot proliferation from different explants (whole seed, embryo, apical meristem, thin layer of cotyledonary node, regenerated dry seed) and to use the particle gun technique for the genetic transformation of bean.

Through these activities, new hormone (mainly Thidiazuron)-tissue combinations were investigated in order to improve the in-vitro regeneration efficiency. Results of particular interest were achieved in P. coccineus.