Thorpe, T.A. (ed.): ***In Vitro* Embryogenesis in Plants**. - Kluwer Academic Publishers, Dordrecht - Boston - London 1995. 558 pp. NLG 400.00.

The book is composed of twelve chapters differing both in their content and size. The first one represents historical survey of W. Halperin, one the pioneers in the field of somatic embryogenesis (SE) *in vitro*. He documents the basic phenomenology of the formation of somatic embryos on classical model material - carrot cell and tissue cultures. He is trying to formulate and answer some classical controversies and unresolved problems: - Are there special chemical factors which promote SE?- Is cell isolation required to induce SE? - Single versus multiple cell origin of embryos. - Do buds form in carrot callus cultures? The last question is making a logical bridge toward subsequent chapter on Asexual embryogenesis in vascular plants in nature (Sharma and Thorpe). To what extent and why some taxons prefer regeneration *via* organogenesis whilst the other ones SE as the way of chance? Are there any consequences in their natural growth/developmental specificities *in vivo*? As Sharma and Thorpe postulate, the phenomenon of agamospermy, *i.e.* production of fertile seeds in the absence of sexual fusion between gametes *in vivo*, is highly frequent both in angiospermae and gymnospermae. Adventitious embryony and/or apomixis in various forms has been recorded in at least 94 families.

Concerning knowledge of mechanisms of asexual embryogenesis in vivo most of the detailed work has mainly concentrated on *Citrus* species where nucellar polyembryony has been used to initiate root stocks which are invariably uniform and vigorous in contrast to the occasional weaker and variable hybrid zygotic seedlings. However, theoretical outcomes of these studies concerning both external and internal factors participating in the induction and further regulation of the somatic embryogenesis *in vivo*, are only fragmentary. Mostly empirical knowledge of the conditions under which SE *in vitro* was realised is convincingly documented by a huge sum of information compiled in final three chapters of the book, which represent together two hundred pages: Somatic embryogenesis in herbaceous dicots (Brown *et al.*); Somatic embryogenesis in herbaceous monocots (Krishnaraj and Vasil); Somatic embryogenesis in woody plants (Dunstan *et al.*). One should appreciate any effort of the authors to make conclusions from hundreds of publications they summarized - focused to the research strategy, genotype and media manipulation, explant choice, *etc.* These chapters represent very useful starting point for anybody who looks for the advice how to overcome actual problems with particular tissue culture. The phenomenological similarity of the development of SE to zygotic one - at least in some model systems - logically lead to the opinion, that our better knowledge of the biology of the development of either zygotic embryos (Raghavan and Sharma - Zygotic embryogenesis in gymnosperms and angiosperms; Monnier - Culture of zygotic embryos) or haploid - *i.e.* pollen ones (Haploid embryogenesis - Ferrie *et al.*) could elucidate common mechanisms of these processes. As the focal point of the book one could perceive chapters concerning Morphogenetic aspect of SE (Merkle *et al.*), Physiological and biochemical aspects of SE (Nomura and Komamine) and, of course, Molecular biology (Dudits *et al.*). Their contents are inevitably overlapping and data received through systematic study of one model material are only partially valid for the other one. Taking into account the whole developmental pathway of SE (induction - proliferation- histodifferentiation - early maturation - late maturation- dessication - germination - conversion), the broad spectrum of the physiological events studied in connection with this phenomenon is understandable. It involves investigation on cell cycle, mode of action of phytohormones - their receptors, signal proteins, cytoskeleton studies, *etc.* The embryogenic induction cannot be understood without knowledge of the way for re-programming of the gene expression and initiation of a coordinated cascade of synthesis of new embryogenic transcripts.

Beside the applied aspects (plant micropropagation through bioreactor produced propagules or artificial seeds, most rapid regeneration of transgenic plants) the investigation of the embryogenesis *in vitro* yields a broad spectrum of data concerning basic mechanisms of plant developmental biology. The book will be useful, therefore, for cell and molecular biologists, plant physiologists as well as for breeders working in horticulture, agriculture, forestry. Excellent selection of authors and top quality of the information is characteristic for this monography as well.

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