Hall, R.D. (ed.): **Plant Cell Culture Protocols**. (Methods in Molecular Biology Vol. 111). - Humana Press, Totowa 1999. 421 pp.

Only a few shortcomings can be found in this high quality compendium of modern protocols, describing various works of plant explant (*i.e.* cell, tissue, organ, *etc.*) cultures. However, the first is evident the very moment the reader picks up the book: it lies in the title itself. Contrary to what is suggested by the title, this compendium is not about "real cell cultures *sensu stricto*" - meaning somatic cell cultures grown as "cell lines", analogues of animal "HeLa cells". While, for example, Nagata's BY-2 real cell lines might be hidden somewhere in the text, this term is definitely not found in the chapter titles. The term "cell culture" is used in the same general manner as in many other publications of Vasil, Ammirato and other editors of the 80's. "Cell culture" is simply used as an all-encompassing term for various types of *in vitro* plant cultures, somewhat like a commercial trademark. The world unfortunately has not accepted the elegant term "explant culture", preferred by this Czech reader. (What a pity.) The editor is fully aware of this *faux pas* and immediately tries to smooth it out in the first paragraph of the introductory chapter. However, it is unlikely that the founders of this topic, such as Schleiden, Haberlandt, White or Gautheret, would agree with the following argument of the editor: "... it is now possible to culture plant cells in a variety of ways: individually (as single cells in microculture systems); collectively (as calluses or suspensions on Petri dishes, in Erlenmayer flasks, or in large-scale fermentors); or as organized units, whether this is in shoots, roots, ovules, flowers, fruits and so forth...".

The central theme of the book, however, is not the application of these "cell cultures" in theoretical biology. Instead, this text is focused on other priorities, determined by the location of its origin (CPRO DLO Wageningen) and by many years of Dutch hands-on experience with *in vitro* propagation and breeding of agricultural crops, fruit trees, vegetables, ornamental plants (the current production of 100 million micropropagated plants is mentioned in the introduction). The established priorities of this book include: *in vitro* regeneration, micropropagation, somatic hybridization, and fine gene manipulations including transgenosis. Gene source maintenance *via* cryopreservation is also discussed. The last chapters, however, are devoted to several semindustrial techniques such as secondary metabolites production (classic antrachinon and alkaloids, modern betalains), which have yet to be thoroughly tested.

The editor's hand was mostly lucky in selecting authors, as it reached for well-known and accepted scientists and their teams. To mention just few: Mr. and Mrs. Vasil - grain transformation, Mr. and Mrs. Datta - rice transgenosis, Kristina Glimelius - somatic hybridization of *Brassicaceae*, Horst Lorz - microspore cultures of barley, E. Heberle-Bors - pollen embryogenesis in tobacco, Philippe Boxus - micropropagation of strawberry. Even names of classics like E.C. Cocking and J.A. Thorpe are not left out. However, the author selection does not mean that the protocols are written in the style of out-dated textbooks. The combination of many years of experience with new experimental entries is often very successful and of high quality. The editor's deep knowledge of this type of work and it's problems is evident from the first chapter, written by the editor himself. From a teaching viewpoint, this chapter is almost flawless. It describes not only the procedures themselves, but also explains why individual procedural steps were selected. Certain parts of this chapter, especially the final "Precautions and hints to success", represent very interesting reading even for a very experienced specialist.

In this context, it is a shame that the author did not allow for the luxury of including at least a few less "practical" chapters - for example, the previously mentioned information on plant cell lines, as they are irreplaceable models for plant cell behavior studies. In addition, some results of these studies will most probably be a key factor for applications leading to the understanding of cell cycle regulation, the mechanism of phytohormone effects, cell differentiation, morphogenesis, production of secondary metabolites, *etc.* Furthermore, many other chapters would deserve at least a little bit more "theory". For example, the chapter devoted to *in vitro* potato techniques is for an unknown reason rather shallow. The title selected for this chapter, "Callus initiation, maintenance and shoot induction", is also not very logical. One might accept that the editor was trying to maintain a uniform pattern of relevant chapter titles. Consequently, all special areas, *e.g.* microtuberization and

it's practical uses (also performed within laboratories in Wageningen) are missing. More attention should have also been given to somatic embryogenesis in trees, especially conifers (including the conversion of embryos, artificial seeds, *etc.*).

However, the book definitely does not lack various interesting "curiosities" about both methods and materials. One example is the chapter about isolation and cultivation of guard cell protoplasts, including their use to regenerate new plants, in addition to the chapter about silicon carbide whiskers used as an alternative for particle bombardment or microinjections in transgenic plant preparation. Microprotoplast mediated chromosome transfer and *in vitro* fertilization with isolated single gametes also have yet to become major experimental areas.

In spite of the above shortcomings, this textbook, undoubtedly represents one of the highest quality manuals on this topic published within the last ten years. It can be strongly recommended to specialists working in institutions, which focus on the practical uses of plant explant cultures, as well as to experimental biologists. It may also serve as a guide for beginning specialists. Last but not least, it will assure the relevance of an important scientific discipline, plant biotechnology, in today's world.

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