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*Fig. 2 at the end of the issue.*

#### BOOK REVIEW

RUBENSTEIN, I., PHILLIPS, R. L., GREEN, C. E., GENGENBACH, B. G. (ed.): *MOLECULAR BIOLOGY OF PLANTS*. — Academic Press, New York—London—Toronto—Sydney—San Francisco 1979. 343 pp., US \$ 27.50.

This proceedings' volume results from a symposium on plant molecular biology held at the University of Minnesota in 1976. It contains 12 contributions organized into three sections. The first topic is concerned with nuclear and chloroplast DNA (4 papers, 137 pp.). Particular attention is paid to the problem of origin, organization and functional and phenotypic significance of repeated sequences, and the methodology and original results of reassociation kinetics together with proposed models of some plant genomes are presented. Experimental evidence is provided supporting the idea that families of repeated sequences are created as clustered repeats which are subsequently dispersed throughout the genome. Discussion on DNA replication is based on autoradiographic studies of DNA fibers focused on structure, organization and functions of replicons. Chloroplast DNA is examined from the aspect of its physical properties, information content, and mechanism of replication.

Section II (4 papers, 103 pp.) deals with molecular aspects of genome expression. The biological problem of differential DNA replication and of its relation to phenotypic expression is discussed on plant rRNA genes. The number and efficiency of utilization of rRNA genes varies considerably between different species and there are examples of differential replication of rRNA genes in various plant systems. The association of production of genotrophs in *Linum usitatissimum* with a change in rRNA gene redundancy suggests that the level of rRNA genes influences phenotypic expression. The flow of genetic information from the DNA sequences into the RNA molecules results from the function of three separate systems for transcription indicated as RNA polymerase I, II and III and from metabolic processing of RNA polymerase transcripts. RNA polymerase II and poly A polymerase systems involved in mRNA formation are described in detail, and their physiological relationship during the maturation of maize grains is discussed in relation to understanding the regulatory mechanisms of gene expression. The problem of translation of the transcribed information is examined on wheat germ system using TMV-RNA with the focus on factor requirements for 40S and 80S complexes formation in protein chain initiation and on the function of the 5'-7-methylguanosine "cap" in the attachment of mRNA to the 40S ribosomal subunit. How the expression of genes in higher plants can be influenced by hormones is shown on hormonal control of enzyme formation in aleurone layers of germinating barley grains. Although the regulation of  $\alpha$ -amylase synthesis by gibberellin is well demonstrated and understood, the primary effect of the hormone remains unknown.

The third section is devoted to molecular biology of plant viruses and bacterial agents (4 contributions, 97 pp.). The virological topic discusses replication of viral RNA and the possible modes of synthesis of proteins coded for by the virus genome, and describes the properties and replication of viroids causing spindle tuber disease of potato. The recent finding that the oncogenic properties of *Agrobacterium tumefaciens* is associated with the presence of large bacterial plasmid increased the interest in this area of research. The problem of induction of crown-gall tumors by bacterial agents is surveyed critically with special emphasis on molecular biology of *Agrobacterium* plasmids.

The importance of the book consists in that it provides rapid information on the state of knowledge and on problems and perspectives of research in the principal areas of molecular plant biology.

J. TUPÝ (Praha)