Meetings

Arabidopsis Research

The increasing interest in *Arabidopsis thaliana* as a model plant for research in developmental physiology and genetics was reflected in the discussions during the first international symposium on *Arabidopsis* research held in Göttingen, Germany, 21–24 April 1965. This small, cruciferous plant is especially suited for experimentation. It can grow in varied habitats, requires little space, reproduces rapidly, and produces abundant seeds. It also has clear phenotypic marker genes and a low number of chromosomes. The rapid progress of *Arabidopsis* research was summarized in the opening addresses by F. Laibach, the discoverer of this "botanical *Drosophila*," and by E. Reinholz.

In a session on taxonomy and variation Berger reported on taxonomic confusion within *Arabidopsis* and related genera. She compared various taxonomic systems in the older and the more recent literature. In order to clarify these relations, which up to now are based on morphological differences only, the stress was laid on attempts to reveal genetic connections by means of interspecific hybridizations. Some experiments of this kind were successful after application of embryo-culture techniques (Kribben). Insufficient seed production occurring frequently in autotetra- and hexaploids of *Arabidopsis* was attributed to reduced fertilization, faulty development of the embryo sac, and embryonic lethality, respectively (Bouharmont). The ecotypic variability of *Arabidopsis* in different localities was demonstrated in particular by the different vernalization requirement of various natural races (Ratcliffe and Cetl).

The problem of vernalization was treated from a physiological and genetical point of view. Some new experimental results were given by Napp-Zinn, sustaining his earlier theory of vernalization response by interaction of thermolabile and thermostable products. Two complementary major genes, distinguishing the two natural races Dijon and Limburg-2, were described by Van der Veen as the genetic background for late flowering. Opposite correlations between flowering time and some morphological characters, such as the number of inflorescent shoots, were established in early and late flowering races, respectively (Barthelmess).

The present knowledge on linkage between many morphological and developmental markers was summarized by McKelvie. Additional data were given by Rédei. The five linkage groups corresponding to the chromosome number of $n = 5$ have not yet been fully established. Between some genes of the fourth linkage group of Rédei, the first certain proof of mitotic recombination in higher plants was shown (Hirono and Rédei). An unusual segregation of mutation induced by x-ray was explained by Rédei on the basis of preferential chromosome segregation during the two meiotic divisions or by postreductional selection of secondary sporocytes or basal megaspores developed from twin megaspore mother cells. Some new aspects on the constitution of the extrachromosomal "plastom" were noted by Röbbelen on the basis of an experimental proof of backmutation and induction of plastom mutations.

Mutant analysis was discussed by Jacobs. By isolation and characterization of nutritional mutants in sterile culture he obtained various forms which required amino acids, thiamine, uracil, and nicotinic acid, respectively, for normal growth. The thiamine biosynthesis was studied by Feenstra. He used 45 mutants which can be supplemented by the pyrimidine (19), or thiazole moiety (12), or by the whole vitamin molecule (14).

Reports on mutants with deficiencies in leaf-pigment were presented. Studying the influence of various external factors such as light intensity and quality, or some metabolic inhibitors, Rédei observed the varying size of white sectors on the leaves of a variegated mutant, thus demonstrating clearly the action of an unstable suppressor gene. With a chlorina mutant, Veleminsky and Röbbelen determined the relations between pigment content (in particular, the ratio of chlorophyll *a* to chlorophyll *b*) and the chloroplast fine structure. The possibilities of making use of chlorophyll mutants for electron microscopic studies on membrane differentiation in chloroplasts were exemplified by Röbbelen.

Secondary effects during mutagenesis were described by Reinholz and Müller. They mentioned malformations caused by x-rays and the chimerical structure of the treated plants. The incorporation of mutagenic chemicals into the sensitive sites within the cell nuclei was studied by use of tritiated DNA (Bonotto), and tritiated ethyl methanesulphonate (Walles and Ahnström). By using thymidine base analogues Brown, Bhatia, and Smith were able to induce some lethals, flowering time variants, and so-called laggards. The mutagenic effects of alkylating agents, such as ethyl methanesulphonate and nitrosoamides, were discussed by Jacobs, Müller, and Gichner. Comparing the efficiency of various *N*-methyl- and *N*-ethyl-nitrosoamides the last author brought forward some data in favor of the diazoalkane hypothesis of their mode of action.

Suggestions on a uniform gene symbolization, terminology of chlorophyll mutants, the mapping of genes, and maintenance of stocks were made. The necessity of some kind of permanent coordination of *Arabidopsis* research, as it has been tried until now by the circular letter of "*Arabidopsis* Information Service" was emphasized. Interested persons who want the proceedings of this symposium, including the lectures and discussions, may contact me.

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Forthcoming Events

December

2–3. Northern Gulf Coordinating Council on **Wildlife Management and Mosquito Control**, mtg., New Orleans, La. (G. R. Hayes, Jr., P.O. Box 60630, New Orleans)