

Book Reviews

Poddubnava-Arnoldi, V.A.: Cytoembryology of Angiosperms. Principles and perspectives (in Russian).

Moskwa: Inst. "Nauka" 1976. 507 pp., 161 figs. Bound rubels 3,84.

This monograph written by the grand old lady of Russian plant embryology, consists of a preface, 11 chapters and a bibliography in Russian and foreign languages. With such a great amount of information on cytoembryology published in the last years, it has become absolutely necessary to generalize new data because publications in this branch which appeared earlier fail to reflect the present state of this discipline. It is mentioned in the preface that embryology and cytology of Angiosperms are closely interwoven and, therefore, can be combined in one branch of science - cytoembryology, as cytology and genetics are combined in cytogenetics. Cytoembryological characters and embryonal processes are reviewed in their full complexity and diversity, in interaction with each other and with their environment. The author proceeds from the idea of unity of ontogenesis and phylogenesis; from the necessity to study cytoembryological characters and embryonal processes in connection with the development of a flower, seed and fruit and from the necessity to use various methods of research. The author pays special attention to the experimental method of investigation since this method helps find regularities peculiar to the process of reproduction. In foreign references on cytology and embryology little attention is paid to the work of Russian cytoembryologists, therefore, the author gives detailed review of research done by the Russian scientists in this field, otherwise difficult to ascertain.

The 1st chapter of the monograph covers history of cytoembryology from the beginning of the XX. century. This period dates from the discovery of double fertilization in angiosperms, made in 1898 by S.G. Navashin.

The principal feature of the first works was the use of descriptive comparative-cytoembryological and experimental methods of research. The 2nd chapter gives the definition of the term "cytoembryology"; methods of research on fixed and living material with the help of cyto- and histochemical reactions using light, luminescence and electron microscopy. Organ, tissue and cell cultures in vitro and other methods are described. The 3rd, 4th and 5th chapters contain descriptions of male and female generative spheres, accenting meiosis in micro- and macrosporogenesis, both normal and disturbed by hybridization, polyploidy, mutagenesis and action of unfavourable conditions of environment. The 6th chapter reviews different types of pollination and fertilization in normal conditions, and in those disturbed by various reasons. In the 7th and 8th chapters different types of endosperm and embryogenesis are described; disturbances caused by different conditions are discussed. The 9th chapter deals with the problems of origin, evolution and importance of various types of asexual reproduction. The 10th and 11th chapters show the importance of cytoembryology for taxonomy, phylogeny, genetics and selection. Evolution of cytoembryological characters, problems of selfincompatibility, combining inability, sterility, sexual change, apomixis, polyembryony and

parthenocarpy are reviewed in detail in the last two chapters. Several examples show the achievements of experimental cytoembryology in investigating reasons of incompatibility and sterility in remote hybridization, haploidy, polyploidy and mutagenesis; modern methods to overcome incompatibility and sterility, to artificially obtain polyembryony, parthenocarpy and apomixis are stated. Side by side with the species the description is given of embryonal processes of some remote hybrids, haploids, polyploids, apomicts and mutants with special preference to cultivated and useful wild angiosperms.

At all the stages of individual development of plants, striking regularities and succession in differentiation of cells, tissues and organs are noted; this confirms the existence of certain, as yet unstudied, mechanisms which control embryonic processes. It is of vital importance to study regulating mechanisms since it will make possible the control of these processes for origination of new forms useful to man.

This monograph is designed for the biologists of various specialities working in morphology, cytoembryology, physiology, genetics and plant breeding. It shows from another time the important contribution of Russian plant embryologists to the knowledge of basic facts in reproduction in higher plants.

H.F. Linskens, Nijmegen

Hondelmann, W.H.J.: Erdbeerzüchtung. Probleme, Methoden, Ergebnisse (Fortschritte der Pflanzenzüchtung, Beihefte zur Zeitschrift für Pflanzenzüchtung Heft 7).

Berlin-Hamburg: Paul Parey 1976. 76 pp., 10 figs., 17 tabs. Bound DM 39,60

In this new issue of the "Advances in Plant Breeding" we are informed of the problems and the recent state of strawberry breeding, the great success of which we have witnessed during the last two decades. The author of this review was a long-standing co-worker of von Sengbusch (to whom this booklet is dedicated), whom the gardeners and garden friends in most parts of Europe should be grateful for the well-known Senga cultivars.

In the different chapters mainly problems of interest for the practical plant breeder are considered; however, we also learn something about the genetical and physiological background of the strawberry (ploidy level, sex expression, growth rhythms), for instance the interesting possibilities of exploiting the gene resources of related wild species thus establishing a much broader genetic base for further breeding work than is now available.

Breeding aims, problems of breeding research and of breeding for different characters (e.g. freezing quality, mechanical harvesting), resistance breeding, breeding layouts and maintenance breeding as well as economic questions of strawberry cultivation are the topics of the other parts of the book which are very deeply influenced by the author's experiences with strawberry breeding. Thus we have at our disposal a clearly and lively written record which can be recommended to all who are interested in plant breeding work.

P. Hanelt, Gatersleben