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## Book review

**Singh, R. J. 1993. Plant Cytogenetics.** CRC Press, Boca Raton, Florida, USA. 416 pp., 99 figs., 122 tables, Hard Bound, DM US \$. 96.00 ISBN 0-8493-8656-X.

Cytogenetics has played an important role in understanding the chromosomal and genetic architecture of plant species. Since the publication of chromosomal theory of inheritance (1902–1903), a great wealth of information has become available on chromosome pairing, crossing over, chromosome maps, and genomic relationships. Various cytogenetic stocks representing numerical and structural aberrations of chromosomes have been developed and employed in constructing genetic and molecular maps in several plant species. More recently, chromosome engineering techniques have become an integral part of genetic and breeding research.

Since the publication of an excellent text on plant cytogenetics, (*Discussions in cytogenetics*) by C. R. Burnham in 1962, plant cytogenetics has witnessed many advances. Thus there was a great need for an updated and comprehensive book on plant cytogenetics. The publication of this book is thus very timely.

The contents of the book are arranged into eight chapters: (1) introduction, (2) the handling of plant chromosomes, (3) cell division, (4) genetic control of meiosis, (5) karyotype analysis, (6) chromosomal aberrations: structural and numerical chromosomal changes, (7) genome analysis, and (8) chromosomal aberrations in cell and tissue culture derived callus and their regenerants.

The book provides an excellent review of various techniques in handling of chromosomes, karyotype analysis, genetics of meiosis, genomic relationships, and chromosome manipulations. In addition to his own studies, Dr. Singh has made extensive use of the information published in various journals.

In chapter 1, Mendel's laws of inheritance have been discussed at length. However, inclusion of some of the major discoveries in chromosome research and discussion of parallelism between Mendel's laws of inheritance and chromosomal theory of inheritance

would have been useful. Several simplified procedures for handling of meiotic and mitotic chromosomes have been presented in chapter 2 with photographs. Cell division has been well explained with simple and clear photographs describing various aspects of mitotic and meiotic divisions. However, brief introduction to meiotic divisions during megasporogenesis in apomictic species would have been appropriate. In subsequent chapters, the author has elegantly described genetic control of meiosis, analysis of chromosomal aberrations—both structural and numerical changes. Procedures for development and characterization of different types of aneuploids and chromosomal interchanges have been well illustrated. The methodology and usefulness of such cytogenetic stocks in genetic mapping with relevant examples have been nicely presented. Table 6.76 on alien chromosome substitutions should have been titled alien chromosome additions. Genomic relationships have been well explained with selected examples on wheat, cotton, soybean and tobacco. The last chapter describes chromosomal aberrations in cell and tissue culture and their regenerants in a simplified form.

A chapter on advanced techniques in cytogenetics particularly molecular cytogenetics such as fluorescence in situ hybridization (FISH) and chromosome image analyzing system would have added to the value of the book. Also, an additional chapter highlighting the application of various cytogenetic techniques in plant improvement would have added to the usefulness of the text.

The contents of the book are well arranged and easy to read and understand. It should serve as a useful text book for students taking courses in genetics and cytogenetics and as a reference book for scientists engaged in plant cytogenetic research.