

phylogenetic proximity of *Psathyrostachys* with *Pseudoroegneria* (N-S) in concordance with previous isoenzymatic analysis (McIntyre 1988). The present results also confirmed the proximity of the three *Triticum* genomes (A-B-D) which are believed to be the procurors of hexaploid wheat and closely associates them with the P and R genome (A-B-D-P-R). The other common cluster in the trees associated *Thinopyrum* and *Hordeum* (E-J-I). Discrepancies with other phylogenetic trees previously constructed (Appels et al. 1989) were not completely unexpected since different sources of genetic variability were tested in the present study.

A positive correlation between the geographical origins of some accessions within species and their branch-distribution patterns in the phylogenetic trees was detected. In the case of *A. desertorum*, the branch-clustering patterns suggested a particular geographical pattern that could provide interesting insights into the dispersion of these crops in the Eurasian continent. The fact that many of the phylogenetic relationships scored using RFLPs were consistent with previous taxonomic studies, provides valuable evidence for reconstructing the evolution of the tribe Triticeae.

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## Book reviews

**Enrique Sanchez-Monge: Flora Agrícola: Taxonomía de las Magnoliofitas (Angiospermas) de interés agrícola, con excepción de las aprovechamiento exclusivamente ornamental o forestal.** Ministerio de Agricultura, Pesca y Alimentación. Madrid, 1991, 1296 (I volume) and 680 (II volume) pages.

*A flora of interest to agriculture and in search of an English translation.*

*The content.* This is an ecumenical summary describing the identification of species of plants of interest to agriculture. For each species are given: specific name, synonyms, taxa, botanical description, chromosome number, utilization, type of reproduction, area of diffusion, name in several languages. For the genera

it is included the botanical description, the basic chromosome number and the dichotomic key to be used to classify the species. Similar informations are summarized for the families, including the dichotomic key to divide the genera. The basis for the inclusion of a genus in a family is the existence of at least one species reproduced artificially by man, or, even if not so, at least systematically exploited as source of food, forage or industrial products. The review covers all angiosperms with the exclusion of the forestal species and of those used as ornamentals.

*Why this is an important book.* In 12 years of hard work the author has summarized in the first volume an incredible quantity of bibliographical informations, before dispersed in hundreds of articles and journals. In total the citations are more

than 2300 and cover around 4000 species. What type of information is given? An example: The family *AMARANTHACEAE* covers 9 pages out of the 1221 dedicated to the analytical description of species. The main characters of the family are first described, together with a key for genera (4: *Celosia*, *Amaranthus*, *Conophrenia*, *Alternanthera*) and species identification (together 21). Genera are presented singularly, as also the species within each genus. The curious scientist can read about 1/3 of a page for each species. He will have also access, for example, to the 61 names known all over the world for *A. caudatus*. The use is reported 1.) of leaves as salad for *A. caudatus*, *dubious*, *gracilis*, *gracizans*, *hybridus*, *lividus*, *palmeri*, *retroflexus*, *spinosus*, *torreyi*, *tricolor*; 2.) of the plant as forage for *A. dubious*, *gracizans*; 3.) of the seeds for human consumption for *A. caudatus*, *dubious*, *gracizans*, *hybridus*, *lividus*, *palmeri*, *retroflexus*, *torreyi*.

A central interest for the taxonomist is the very detailed description of the botanical characters, a description largely sufficient both for basic studies and field work. From the regions of cultivation which are also cited, an indirect appreciation of the environmental necessity of the species described can easily be extrapolated.

*Author self-control.* The book is written in a crude botanical style: no one single word is used if not strictly necessary. From this point of view, E. Sanchez-Monge has produced a Flora in the best taxonomical tradition. The level of information is kept more wide when the uses of a species are described: for *Hibiscus cannabinus*, for instance, it is a surprise to know that the species, besides cultivated for cellulose production, produces also edible seeds which can be used to extract an oil usable as fuel, or that young leaves can be consumed by humans as salad or by animals as forage.

*In general.* My judgement is already summarized after the title of this review: the book largely merits an English translation and a worldwide diffusion. It has to be said that the second volume is already a key available to Spanish-, German-, French-, English-, Italian- and Portuguese-speaking scientists: it contains ten indexes of the first volume which are based on the scientific names of the species and on their names in several languages. A translation of the first volume will be, nevertheless, of extreme interest to geneticists, plant breeders, botanists, ecologists and alimentarists from all over the world: an up to time catalogue of plant biodiversity focused on human needs is now available.

F. Salamini, Köln

**L. Stevens: Genetics and Evolution of the Domestic Fowl.** Cambridge University Press 1991.

This most recent text dealing with the genetics and, to a lesser extent, the evolution of the domestic chicken is a welcome addition to the literature in this field. Students in agriculture, veterinary medicine, as well as postgraduate students in animal related biology will find this book a refreshing up-to-date account of the state of genetics and its techniques as currently known for birds and especially the domestic fowl for which most of the scientific evidence has been developed.

The author covers transmission genetics in chapters 3, 4, 5, 6 and 8 using classical and new examples from the fowl to illustrate relevant principle. In chapter 3, some of the best studied genes of chickens are summarized in a table. Sex linkage in all its essential details is covered in Chapter 4. Chapter 5 covers linkage as well as techniques and examples for localizing genes on chromosomes. The use of translocations, somatic cell hybridization, in situ DNA hybridization are covered, as is the use

of so-called minisatellites in mapping genes. Chapter 6 deals with genes affecting feathering, plumage and skin color along with developmental principle such as the formation of melanin involved in the genetic control of specific observed variants. In chapter 7 classical genes affecting muscles, nerves and the skeleton are covered. In the case of muscle, developmental and structural details as well as molecular control of myosin structure and function are included. Lethal genes are discussed and listed in chapter 8, with several examples from the more recent literature. A useful addition to transmission genetics is in Appendix III where  $\chi^2$  tests are illustrated in the context of the determination of linkage between genes from recombinant experiments.

Quantitative genetics with its applications in breeding poultry for meat and egg production is given a brief but effective review in chapter 9 with an extended list of references and recommended further reading.

Chapters 10 (Protein Evolution), 11 (Immunogenetics) and 12 (Gene Cloning, Sequencing and Transfer) as well as chapter 1 (History and Evolution) give an up-to-date review of what is known about molecular genetics of the fowl and the implications of such knowledge for evolution of the species. In chapter 10 the molecular structures of some of the best investigated chicken proteins such as egg proteins, globins, histones and insulin are reviewed in development and evolutionary contexts. Besides considering the evolution of a given group of related proteins within bird species; broad comparisons with those of more distantly related genera or families are made with a precision unavailable before molecular structure could be resolved. The examples given in that context are well chosen and stimulate the reader to pursue both technical as well as factual details in further reading.

Chapter 11 deals with important aspects of immunogenetics, a field in which dramatic advances have been made in the past two decades. The author relates principles developed for man and mouse effectively to the most recent findings in chickens, including the structure of immunoglobulins the generation of antibody diversity and the roles of the major histocompatibility gene complex in immunity to pathogens. Chapter 12 gives the concepts and methods required for cloning and sequencing genes. A table listing some 35 chicken protein genes which have been cloned and at least partially sequenced illustrates the importance of the domestic fowl as reference animal for the molecular evolution of birds.

In addition to the 12 regular chapters the text includes 4 appendices and a glossary. Appendix I gives an up-to-date version of the chromosome map of the fowl; Appendix III explains the Chi-Square test and linkage; Appendix IV gives the genetic code; and Appendix II acquaints the reader with oncogenes. This latter subject might well have been included under immunogenetics but, given separately, emphasizes the complexity of virus host interaction in the development of cancer. Perhaps a more detailed treatment of endogenous viruses of chickens might have been added to this text perhaps as a fifth appendix.

In writing this text the author has succeeded in covering an increasingly diverse spectrum of topics relevant to an understanding of the genetics of birds, or for that matter, higher animals. Each subject is introduced with care to explain basic principles and to illustrate with relevant examples. New terminology is highlighted in the text so that quick reference to a special concept of technique is made easy. The references, listed with each chapter, are well chosen and up-to-date. Good organization and a concise style enable the author to include an extraordinary wealth of information into some 300 pages of text and appendices. This book is therefore interesting to read for students as well as specialists in need of updating their knowledge in the genetics of animals.

Hans Abplanalp