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Book reviews

Potato Genetics. J. E. Bradshaw and G. R. Mackay (eds). CAB International, Oxford. 1994. Pp. 552. Price £75.00, hardback. ISBN 0 85198 869 5.

The editors have attempted the difficult task of compiling a volume that covers all aspects of the genetics of a crop plant which is generally regarded as 'less than amenable' to straightforward genetical study. Inevitably they find themselves caught in a circle, trying to present the position with regard to the cultivated European potato, with reference to potato species in general and, at the same time, caught between actual knowlegde of potato and the need to cover basic genetical theory. Overall I think the editors have made a valiant effort to 'square this circle' and thus balance these elements, although the reader must remember that generally the 'default setting' is *Solanum tuberosum* subsp. *tuberosum*.

The book is divided into six parts which together form this generally well constructed and carefully edited book. *Part One* unravels the origins, speciation and cytology, comprising two chapters which set the basic context against which potato genetics in general can be viewed. *Part Two* tackles both the theory and methods of genetical analysis and attempts to present a mixture of underlying theory and specific approaches as applied to potatoes. *Part Three* concentrates on tissue culture and molecular genetics (at this point I started to lose track of the status of the section headings, finding them confusing and sometimes misleading — some bold, some italics, some capitals, some left of margin, and some spaced from the text — there probably is a consistent pattern but I clearly had not been able to cope with it). *Part Four* covers a mixture of topics and is headed 'Environmental stress, Morphology and Quality', which simply reflects the 3 chapters included in this section. *Part Five* turns attention towards the important area of resistance to pests and diseases. Clearly this is a large area to cover and it tends to highlight some of the deficiencies in our knowledge of the underlying genetical determination of the characters of most interest in potatoes. For example, what, if anything, is the genetical relationship between resistance and tolerance? *Part Six*, the last of the book, is entitled Potato Breeding and covers general breeding, true seeds and gene introgression in 3 separate chapters.

As usual with a multi-authored book, there are some overlaps between chapters, some mis-matching and some gaps. There also tends, despite some effort, to be a lack of synthesis — but perhaps we are not yet at a stage where this could easily be achieved. Having said that, the book has obviously been compiled with care and thought. It represents a valuable source of references and a useful summary of our knowledge on the genetics of an important crop species. Nevertheless, while reading the book one gets a feeling of amazement about how much we do know and equally how much we do not know about potato genetics.

PETER D. S. CALIGARI
Department of Agricultural Botany
School of Plant Sciences
The University of Reading
Whiteknights
P.O. Box 221
Reading RG6 2AS,
U.K.

Methods to Assess DNA Damage and Repair: interspecies comparisons. Scientific Committee on Problems of the Environment (SCOPE) 52. R. G. Tardiff, P. H. M. Lohman and G. N. Wogan (eds). John Wiley & Sons Ltd. Chichester. 1994. Pp. 257. Price £45.00, hardback. ISBN 0 471 94256 1.

Any book which includes the words 'methods' and 'interspecies comparisons' in its title conjures up an image of long and turgid tomes recounting endless techniques and mind numbing lists of species differences in behaviour. It was, therefore, a delight to discover a concisely written review which conveyed the essence of an exciting and rapidly expanding field. The impetus for the book comes from the realization that our industrialized society produces increasing amounts of chemicals which pose a potential threat both to human health and the environment. A prime concern has arisen from the realization that many of these chemicals may react with DNA and therefore have 'the potential to cause cancer, mutations and adverse reproductive outcomes'. To evaluate these risks and to plan accordingly, it is necessary to understand how chemicals may interact with DNA, the rationale behind the available methods for measuring the formation of DNA damage, how cells repair and process DNA damage and how the deleterious outcomes arise from the original damaging event.

To cover this range of topics in a short and concise format would seem a near impossible task and the solution was to collect together an internationally renowned group of scientists that were the experts in each of these areas. Under the auspices of the World Health Organisation, the Scientific Group on Methodologies for the Safety Evaluation of Chemicals (sponsored by the International Program on Chemical Safety) held a Workshop at the National Institute of Environmental Health Sciences, Research Triangle Park, N.C. in March 1990. Each expert

was invited to bring their experience and expertise, from the world of DNA damage and repair, to evaluate the current state of knowledge of cellular defence mechanisms and to apply this knowledge to estimate the risks to human health from exposure to genotoxic compounds. The outcome of this workshop was a state-of-the-art review of current understanding, covering mechanisms and dosimetry of DNA damage, biological consequences from mutation induction to carcinogenesis, cellular pathways for repairing DNA damage, and methods for monitoring and assessing exposure in the population. The participants also made recommendations for the future direction of research from the perspective of this meeting.

The focus of the Workshop was not restricted to man but included an up-to-date and brief account of our knowledge of the repair capacities of other species. This served two purposes. First, we are not the only species threatened by environmental exposure to chemicals, and it is essential that we understand how other organisms interact and deal with DNA damaging agents in order to make an assessment of the environmental impact of genotoxic chemicals. Secondly, studies on organisms as divergent as yeast and man have been crucial to building our understanding of the cellular mechanisms for coping with DNA damage.

The Workshop recommendations and overviews have been collected together and published as this monograph. The text is divided into two parts. The first part is a joint report of the Workshop setting out the broad issues of risk assessment, the key information available and the recommendations for future research. The second part is a collection of individual contributions providing an in-depth but succinct overview of the relevant fields. Each chapter is well written and presented. The clarity of the work reflects the high level of expertise of the authors in each area.

This monograph will be an invaluable aid to any professional or student with an interest in environmental risk assessment. However, the greatest strength of the book is seen in the way it brings together a collection of first rate reviews relevant to the broader field of DNA damage and repair. As a concise overview of this exciting and rapidly expanding field, it is an excellent general reference document for those students and scientists requiring a general understanding and broad perspective of the field.

LYNNE V. MAYNE
Trafford Centre for Medical Research
University of Sussex
Falmer, Brighton BN1 9RY
U.K.

Protocols for Gene Analysis. Methods in Molecular Biology (Vol. 31). Adrian J. Harwood. Humana Press Inc., Totowa. 1994. Pp. 411. Price £40.00 paperback (combbound). ISBN 0 89603 258 2.

'Protocols for Gene Analysis' is the 31st volume in the comprehensive 'Methods in Molecular Biology' series. As such, it has a similar style to the previous volumes, each chapter having a recipe-like format designed for direct practical use within the laboratory. The starting point in this volume is 'so you have a piece of DNA, possibly a gene-what do you do next?'. The subject areas covered are wide. The first section of the book deals with basic recombinant DNA techniques and subsequent chapters are grouped under the headings of *in vitro* mutagenesis, genomic structure, sequence variations, gene expression, protein-DNA interactions and protein function. Each section has selected protocols, for instance 'Protein Function' comprises techniques for recombinant protein expression/purification, production of radio-labelled proteins in bacteria for use as molecular probes, and the preparation/screening of a lysogen library.

Adrian Harwood claims in the preface that the aim of the book is to provide a comtemporary set of protocols for each of the subject areas, not a comprehensive set of methods, and this is where the limitations of an otherwise successful book lie. In fact, this is a book which is virtually flawless in terms of style but which fails on the wider level of content: the broad subject areas covered seem rather disjointed when presented merely as a collection of 'selected protocols'. However the logical progression in which the protocols are presented compensates to some extent for this lack of cohesion.

The protocols and introductory text of each chapter are clearly presented with the aid of uncomplicated figures. Each chapter has different contributing expert authors but the standard of the text is consistent throughout. The protocols themselves are reassuringly presented. Many have accompanying notes sections containing words of caution or hints for success and each section is followed by a bibliography. The volume as a whole therefore fulfils its promise of being user-friendly, right down to its comb binding for 'easy benchtop use'.

On whose benchtop then would 'Protocols for Gene Analysis' be of most use? Given that this is not a comprehensive collection of methods it will mainly help researchers who have some knowledge in the field and intend to use the text in conjunction with other sources of information. What you see is what you get and this will be a convenient starting point for people with £40.00 to spare.

CHERYL WRIGHT
Wolfson Unit of Molecular Genetics
Liverpool School of Tropical Medicine
Pembroke Place
Liverpool L3 5QA
U.K.