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## BOOK REVIEWS

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**Annual Review of Nutrition**, 1988, Volume 8, pp. 629, (ed) R. E. Olson, (Published by Annual Reviews Inc. 4139 El Camino Way, Palo Alto, California 94306, USA), Price: USA \$ 37; Elsewhere \$ 41.

The science of nutrition spans over a range of disciplines from cellular and molecular biology to epidemiology, public health, social science, economics, food science, ecology and even political science. Volume 8 of the *Annual Review of Nutrition* like the earlier volumes focusses primarily on advances in experimental and clinical nutrition. Epidemiology and public health aspects are discussed where relevant. Indeed the boundaries between these areas are often ill-defined. The prefatory essay on "Nutrition policy: building the bridge between science and politics", by James Austin and Catherine Overholt explains the need for nutrition scientists to be persistent on scientific issues and communicate effectively to ensure that nutrition policies are governed by scientific considerations. Scientists should learn about political processes.

Genetic epidemiology is becoming important for identifying predisposition to nutritional disorders. The essays on insulin receptors, cachectin and heredity and body fat, bring out the interaction of genetics and nutrition in regulatory mechanisms. The updates on vitamins emphasize the importance of vitamin carrier proteins and regulatory proteins. The article on thiamin shows that progress in understanding the molecular mechanisms of vitamin deficiency disorders is slow. Diseases related to trace elements are also gaining significance.

Nutrient disease interactions, importance of N-3 fatty acids, effects of non-nutritional dietary factors like fibre and alcohol engage the attention of nutrition scientists. The chapter on vertebrate olfaction and taste has new information on molecular mechanisms in these neurophysiological processes and their relevance to nutrition.

Single cell systems are valuable *in vitro* alternatives to animal experimentation. The essay on nutritional requirements of lymphocytes is timely.

In addition to subject index, cumulative indexes of volumes 4-8 for authors and titles are furnished.

Related articles from other Annual Reviews are also listed.

The present volume is of considerable interest to research scientists in cell biology, biochemistry, and nutrition. Public health nutritionists and physicians will also find it useful.

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**Biology of Indian Pteridophytes**, 1987, pp. 283 by S. S. Bir, (Published by Indian Fern Society, Punjabi University, Patiala 147 002), Price: Rs. 200; US \$ 75.

Punjabi University, Patiala is an active centre of Pteridological studies in India where a national symposium was held on the 10th and 11th of January 1986. Fortyfive papers covering diverse fields such as distribution, ecology, phylogeny, cytogenetics, systematics/taxonomy, morphology, experimental and reproductive biology, anatomy, spore morphology, palaeobotany, endangered elements and their conservation, and future strategies in research on Pteridophyta in India were presented. Full text of papers read forms the major content of the book; the technical part starts with a write-up about the symposium followed by the presidential address of Kachroo in which the phylogeny of some genera of Aspidioid, Asplenioid and Pteroid ferns is dealt with. On the basis of the chromosome and other supporting data, *Denstaedtia*, *Hypolepis* and *Pteridium* are heterogeneous and the role of aneuploidy is very great.

Bir, Rani and Verma add 12 more species from Simla hills.

Devi and Singh draw attention to the aerobiology of the fast spreading nature of *Pteris vittata* in urbanized areas causing allergic reaction in man. Since the species is widely distributed, further studies may become useful.

Dixit stresses the immediate need of conservation of tree-ferns in India, and certainly, preservation of

these ferns is an urgent need. About 12 to 13 species of tree-ferns grow in the country, but nowhere is this fern common and what is left over disappears fast. Towards the end of the book Bir also deals with rare and endangered Pteridophytes.

Suthar and Sharma give an account on the anatomy of *Solenostelopteris jurassica* and its associated organs. Ampiphloic solanostele cannot be regarded as a taxonomically important character since it occurs in the rhizome of a number of taxonomically widely separated living ferns. However, the exarch protoxylum points and the single C-shaped leaf traces suggest that *Solenostelopteris* is a very primitive fern. The sporangia are typical of Schizaeaceous ferns in general and *Schizaeangium* in particular.

Although propagation by leaf buds is very common among ferns, their morphology and development are scarcely studied. Loyal and Bhatia review the situation and give an account of the inception and organic potential *in vivo* of *Ampelopteris prolifera*. They point out that the intermediate fronds regulate the organic potential of the buds and the mode of origin of the leaf buds is similar to bud-forming detached meristems.

Mukhopadhyay and Sen show that variation in stelar structure of Indian *Selaginella* is profound and can be classified into two groups and these groups have evolved from hypothetical ancestors in two lines of descent. The term polystele should be replaced by dictyostele while describing the anatomy of the genus.

Mukherjee and Sen describe the gametophytes of 15 species of tree-ferns belonging to the genera *Cyathea*, *Cnemidaria*, *Dicksonia*, *Cibotium* and *Culcita*. They show close similarities except that in *Culcita*, hairs appear early and scales are absent.

Sharma, Suthar and Bohra review the work on Indian fossil Pteridophyta of a decade. The majority of the fossils come from the Mesozoic onwards. Only *Equisetum* is continuous. Representatives of Osmundaceae, Gleicheniaceae, Schizaeaceae, Cyathaceae and Polypodiaceae are present and this, in the Mesozoic flora speaks of the antiquity of these families.

SEM studies on 11 species of *Ophioglossum* spores by Khandewal reveal that spore morphology is of little value in taxonomic considerations of the genus.

Malik and Bharadwaja provide an account on the ontogeny of phloem in *Athyrium falcatum*.

The spike or the common fertile system of *Ophioglossum* has been variously interpreted and

most of the views hold that it is either a pair of fused leaves, two fused pinnae of a frond or a modified telome system. It is also interpreted that the fertile part is fused with either the stalk of the frond, or the spike originates directly from the lamina as is the case with Glossopteridales. *Glossopteris* and *Ophioglossum* resemble each other in their tongue-shaped leaves with reticulate venation. *Glossopteris* fructification can be correlated with that of *Ophioglossum* spike on the basis of telome concept and if it is presumed that the spike has a condensed leaf or pinna with marginal sporangia, the sporophyll of *Glossopteris* may be derived as a result of widening of the lamina and shifting the sporangia to the abaxial surface as has been conceived in the phyletic slide theory of Bower.

On the basis of 114 W. Himalayan ferns, Verma and Sharma conclude that 37.72% are polyploids, 7.02% apomicts and 1.75% hybrids. The maximum polyploidy obtained is octoploid. They state that the W. Himalayan ferns show higher polyploidy and hybridization than the E. Himalayan ferns.

Razdan, Kachroo and Bir present a comparative account on the morphology and cytology of 5 species of Aspleniaceae from Kashmir. Spore morphology, structure of scales and chromosome numbers are correlated.

Ecological data are essential for the conservation of any species. Vasudev and Bir provide an account on the ecology and taxonomy of Pteridophytes of Tamia Hills and Patakot Valley of Madhya Pradesh.

Loyal, Dhindsa and Kaur give an account of the morphogenesis of two species having *Aspidium* type of development in prothallus. Their conclusion is very significant in that the classical single cell apex is untenable.

Because of great variation in the morphology of the pinnae, *Polystichum* Roth is a very difficult genus to be dealt with taxonomically. Khullar gives a brief note and a key to the W. Himalayan species.

Padala and Bharadwaja observed uni-, bi-, and multiseriate veinlets in the foliar parts of *Ampelopteris prolifera*, *Dryopteris cochleata* and *Araiostegia pseudocystopteris*. Rarely vessel-like elements, occur at terminal or lateral positions of the veinlets. Pitting pattern is scalariform and reticulate. Placental tracheids are also present.

According to Sharma, Purohit and Vyas the epidermal structure and anatomical features in species of *Adiantum*, *Actiniopteris*, *Cheilanthes*, *Tectaria* and *Hypodematum*, found in Rajasthan

show superficial stoma without subsidiary cells. Mesophyll cells in *Adiantum incisum* and *A. capillare* are papillate while in all other species they are non-papillate. Papillate cells are regarded as modification for drought resistance. Species without papillate cells have other characters for arid conditions. It would have been more meaningful if material from other parts of India were also studied.

Bharadwaja, Gena and Verma point out that two species of *Athyrium*, one species each of *Asplenium*, *Cheilanthes*, *Botrychium*, *Dryopteris*, *Pityrogramma* and *Pteris* have been lost from Rajasthan. Density of species of Pteridophyta is decreasing in Rajasthan in general and Mout Abu in particular. This should be viewed seriously by all those interested in conservation of nature.

Species of *Isoetes* grows in all parts of India except in extreme North West. Gena, Bharadwaja and Sen deal with the species of *Isoetes* in Rajasthan. *I. tuberculata* is widely distributed whereas *I. reticulata* and *I. rajasthanesis* are of restricted distribution. The species ranges from wide to narrow endemism and resembles the pattern indicated by Pfeiffer for American species of the genus.

In the case of several ferns, the scales of rhizomes, in general, are considered to be a taxonomically reliable character. Chandra gives an account of the scales in Drynarioid ferns. *Pseudodrynaria* stands aloof in not having peltate scales. Some phylogenetic trends are also seen in the scales.

Based on a study of apical meristems in five W. Himalayan Hymenophylloid, Davaloid, Athyroid and Polypodioid ferns, Bir and Randhava corroborate their earlier stand in support of Bierhorst as well as the classical concept of single cell apex.

An account of the ontogeny of sporangium in *Isoetes coromandelina* is provided by Sharma, Singh and Rathore. The trabeculae, wall and tapetal cells are similar in early ontogeny. Megaspore mother cell acts as haustorium. A cavity with big lumen is produced. The unused cells modify into wall and trabeculae.

Genetic load in *Pteris vittata* is assessed by Khare and Kaur. Tetraploid plants seem to be remarkably adapted for colonizing new habitats and are widely distributed due to their "ecological, morphological and reproductive traits".

Apical dominance is very common among plants. In contrast to this, Punetha and Kaur show that there is lateral dominance or apical inhibition due to the synthesis of relatively higher quantity of growth

promoting hormone in *Dicranopteris linearis*.

The volume also includes a review of very selected works on Pteridology in India by Bir.

On the whole this volume presents several interesting observations and gives a cross-section of the current trends in the study of Indian Pteridophyta.

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**Experimental and Conceptual Plant Pathology** by R. S. Singh, U. S. Singh, W. M. Hess and D. J. Weber, (Published by Oxford and IBH Publishing Co. Pvt Ltd., 66 Janpath, New Delhi 110 001), 1988. pp. 599, Price: Rs. 295.

The field of plant pathology is growing so rapidly that it is difficult to keep pace with the new developments in areas other than those of immediate interest.

Books having current state of knowledge are extremely useful for students, teachers, researchers and extension workers when the topics are reviewed by eminent experts in the field. Individual articles, contributed by eminent scientists in their respective fields, present a clear, lucid, comprehensive and thought-provoking picture of the topic. This book contains three sections. Section I deals with different advanced molecular biological techniques used in the plant pathological research. Section II deals with pathogenesis and host-parasite specificity in different groups of the plant pathogens and Section III deals with the host-pathogen compatibility and induced resistance. The relationship between inherent disease resistance and potential yield of the plant is also covered in this section.

The authors have thoroughly reviewed the topics and have given due consideration to their own perceptions and ideas. These thought-provoking ideas could effectively be used by postgraduate students, teachers and research workers. This book stimulates research workers to use newer and more accurate techniques and devise better strategies to understand the complexities of host-parasite

interactions. However, there is still scope to improve future editions by including a few more topics in host-parasite specificity in viruses and mycoplasmas.

Unlike text books published abroad, Asian edition books are available at affordable prices. This volume and hopefully other additions in future, that may follow in the series, as the editors indicated, would be valuable if they are priced like the Indian editions of text books or volumes.

Printing is good and the drawings well reproduced. The subject index is quite exhaustive. This is a useful volume for postgraduate students, teachers and research workers.

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## NEWS

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### COSMONAUTS ADAPT RAPIDLY AFTER ONE YEAR IN SPACE

Soviet space veterans, Vladimir Titov and Musa Manarov, who on December 21, 1988 completed a 365-day mission, have almost fully restored their weight, the volume of muscular tissue and vestibular functions, according to Anatoly Grigoryev, Director of the Institute of Medico-biological problems under the USSR Health Ministry.

During the flight Vladimir Titov lost nearly three kilograms in weight, while Musa Manarov, on the contrary, gained nearly two kilos. Jean-Loup Chretien, who spent 25 days in space before returning to earth with them, lost 900 grams.

Titov and Manarov developed partial muscular atrophy of the shins, which is a usual consequence of a long stay in zero-gravity. The volume of the cosmonauts' shins decreased by nearly 20%—a little more than Yuri Romanenko lost during his 326-day flight two years ago. However, this is not the highest figure because after several flights of lesser duration doctors observed a 25% lessening of the volume of shin muscles. This was largely due to the loss of intramuscular fluid and not of muscular tissue. This also explains the rapid rehabilitation.

Data on the state of bone tissues of the cosmonauts are still being processed. But preliminary results show that the lessening of calcium was not as significant as after several previous missions. Immediately after their touch-down, Vladimir Titov and Musa Manarov suffered from the minor

changes of vestibular functions, which passed quickly, and from traditional changes in the water-and-salt metabolism which showed in 5–6% reduction of the content of potassium in the blood.

Soviet specialists have worked out a whole programme of rehabilitation measures which includes jogging, swimming and exercising with a variety of equipment. Grigoryev said that, from the fifth day after landing, Vladimir Titov and Musa Manarov walked 3–4 km and swam 400–500 m in the swimming pool. They also started intensive training of the muscles of the back, shin and thighs, for about one hour every day.

Shortly, Vladimir Titov and Musa Manarov will go to Kislovodsk to rest, where alongside walking, swimming and physical exercises they will play games and take mountain walks. They should completely restore their pre-flight physical form on the 60th–70th day after the landing, by the end of February. After this experts will again study in detail the state of bone tissue and the metabolism. They will be under medical control even after this, for a long time. Experts must be completely convinced that no unfavourable consequences were left by such a long flight. (*Soviet Features—Science and Technology*, Vol. XXVIII, No. 8, January 16, 1989); Published by V. M. Ashitkov, Information Department, USSR Embassy in India, P. B. 241, 25 Barakhamba Road, New Delhi 110 001.)