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BOOK REVIEW

RAMAN A., SCHAEFER C.W. & WITHERS T.M. (eds): *BIOLOGY, ECOLOGY, AND EVOLUTION OF GALL-INDUCING ARTHROPODS*. VOL. 1, 2. Science Publishers, Enfield (NH), USA & Plymouth, UK, 2005, xxi + 817 pp. ISBN 1-57808-262-5 (Set), 1-57808-345-1 (Vol. 1), 1-57808-346-X (Vol. 2). Price GBP 81.40.

This two-volume book presents in 26 chapters the results of the work of forty nine biologists from seventeen countries. It is devoted to interesting and remarkable groups of animals that cause galls on plants. It was edited by: Prof. Anantanarayanan Raman of the University of Sydney, Orange, New South Wales, Australia; Prof. Carl W. Schaefer of the University of Connecticut, Storrs, Connecticut, USA and the entomologist Toni M.

Withers of the New Zealand Crown Research Institute, Forest Research, Rotorua, New Zealand. Before the preface, there is a dedication by all co-authors of this book to the forty eight researchers from all over the world for their contribution to the study of gall-inducing arthropods.

This new book appeared twenty years after the publication of the book by T.N. Ananthakrishnan (1984) “*Biology of Gall Insects*” (Oxford & IBH Publishing, New Delhi, Bombay, Calcutta, 362 pp.) in which fourteen authors summarized the then knowledge on gall-causing insects in eleven chapters. Ananthakrishnan’s book is kept as the general starting point for summarizing the progress in cecidological studies. The present book brings an overview and new results obtained in the last twenty years, when new trails were discovered, hidden secrets of gall

inducing arthropods revealed and new interpretations of known phenomena presented.

After the introductory chapter written by the editors, which includes a brief history of cecidology, there follows a systematic based sequence of chapters. The first chapter is devoted to eriophyid mites (Acari) and is followed by chapters devoted to hemipteroids, including thrips, aphids, whiteflies (Aleyrodidae), psyllids, scale insects (Coccoidea) and Heteroptera; beetles (Coleoptera); flies (Diptera) including gall midges (Cecidomyiidae), cecidogenous tephritids (Tephritidae), shoot flies (Chloropidae) and leaf miners (Agromyzidae); gall-inducing Lepidoptera; cecidogenous Hymenoptera including sawflies (Tenthredinidae and Xyelidae), braconids, chalcidoids, fig-pollinating wasps (Agaonidae) and gall wasps (Cynipidae). One chapter is devoted to the unique, little known, mutualistic association between flies of the genus *Fergusonina* (Diptera: Fergusoniniidae) and nematodes of the genus *Fergusobia* (Tylenchida: Neotylenchidae), which induce galls on host plants of the family Myrtaceae in Australia. Five chapters at the end of the book are devoted to problems of biodiversity and distributional patterns of gall-inducing arthropods in the Neotropics, Costa Rica and Brazil, and to problems of biological control of weeds using gall-inducing arthropods. Interesting information is given in the chapter on dual aseptic culture of gall-inducing arthropods and their host plants, where is described a new method for cultivating aseptically whole plants or plant tissue together with an aseptic gall-inducing arthropod in vitro in a strictly controlled physical, chemical and biological environment. In the last chapter of this comprehensive book the editors summarize the main results presented in the book and express their conviction that “At least two prerequisites of a gall inducer seem to be: small size of the body; and a long history of the inducer’s ancestors with a particular group of plants. The possession of these characteristics may help explain why certain groups (e.g., Cynipidae, Cecidomyiidae) contain many gall inducers, and other more speciose groups contain far fewer (e.g., Coleoptera, Lepidoptera, Hemiptera-Heteroptera)”.

All the authors are experienced workers. Each of them is studying one group of arthropod gall makers. The chapters each provide a long overview of references, which together include about 3000 citations in both volumes. At the end of each chapter there are important recommendations for future research to remove the gaps that presently exist in the knowledge of gall-inducing arthropods.

We have some comments on the chapter “Diversity of gall-inducing arthropods of Costa Rica”. This chapter is a shortened version of a study on the galls and gall-makers in Costa Rica. The authors did not include in their comparison of gall-inducing arthropod richness the important data gathered in Europe, viz. in the Mediterranean area (Houard, 1908–1909), middle and northern Europe (Buhr, 1964–1965) and Asia and Africa (Houard, Trotter, Tavares, Kieffer, Rübsaamen, Docters van Leeuwen-Reijnvaan), and many extra-European countries,

which were published in the journal “Marcellia”, the special journal devoted to the study of galls, which was published from 1902 to 1977. The authors also did not include the rich gall midge fauna of El Salvador, which was discovered by E. Möhn between 1956–1975. He described more than 200 species of the family Cecidomyiidae that cause galls or inhabit galls on various host plants in El Salvador. In addition, the occurrence of gall-inducing arthropods in Costa Rica and Japan (Table 6, on p. 682) cannot be evaluated as “similar” if the gall-inducing Heteroptera in Costa Rica form 7.1% and in Japan 20.6%, and the percentage of gall-inducing Diptera equals to 71.7 in Costa Rica and 45.5 in Japan.

It seems that this chapter was written in a hurry. In Discussion (p. 686) it is written that the sawflies are notably absent in Costa Rica and on the same page, four lines below: “Sawflies are fairly well represented (more than 150 species in Costa Rica)”. On the p. 688 it is written: “In Costa Rica there is about one cecidomyiid species for every eight dicotyledon species”. Whereas on the same page, several lines below, we may read: “More than 90% of dicotyledon species harbour gall inducing cecidomyiids”.

In spite of these mistakes and imperfections, all other chapters of the book are well written and scientifically presented. We would like to mention mainly the chapters written by D. Wool on aphids, on scale insects (Coccoidea) by J. Gullan, D.R. Miller and L.G. Cook, on Coleoptera by B.A. Korotyaev and his collaborators, on Cecidomyiidae by J. Yukawa, O. Rohfrisch and H. Roskam and on Cynipidae by G. Csóka, G.N. Stone and G. Melika.

It is regretful that none of the researchers working on this topic in Africa were invited to contribute. We are sure that the research being done there is very interesting and will bring new insights and suggestions for research.

Nearly all chapters are well illustrated with many drawings and photographs, which are very important for readers. We consider it inappropriate to use in the chapter on gall inducing Coleoptera photographs of galls that are caused by gall midges, with a caption: “*Artemisia* sp. (Asteraceae) in Araks valley, Turkey, usually bears galls induced by several species of Cecidomyiidae (Diptera), but none by weevils, although several species of weevils live on *Artemisia*)” or “*Ephedra* sp. in Erzurum Province, Turkey, bears galls induced by Cecidomyiidae (Diptera), but none by weevils, although four species of weevils live on *Ephedra* in this locality”.

This book is a modern fundamental work of use to entomologists, acarologists, ecologists and all interested in gall-inducing arthropods.

We appreciate the effort of the editors and evaluate this book as a very good. It is, and will be in the future, an important source of knowledge for all researchers, both those that are studying and are starting their studies on gall-inducing arthropods.

V. Skuhrový & M. Skuhrová