

BOOK REVIEW

HAUSMANN K. & RADEK R. (eds.) 2014: **Cilia and Flagella. Ciliates and Flagellates, Ultrastructure and Cell Biology, Function and Systematics, Symbiosis and Biodiversity**. Schweizerbart Science Publishers, Stuttgart, Germany, 299 pp. Hardbound.

This book includes the reports and papers presented at the International Wendland Symposium, held in 2012 in Germany, at which 13 world renowned protistologists met to review and discuss the developments in their respective scientific fields reported in the previous 50 years. The organisms of interest to participants at this symposium are all equipped with locomotory cilia or flagella, hence the title of the book. In the Introductory chapter (17 pp.), Hausmann & Radek summarize the present status of understanding of the fine structure of cilia and flagella and the mechanics of movement and physiology. The voluminous chapter (33 pp.) that follows is on "Ultrastructure" and has two subchapters: Cellular architecture, growth and morphogenesis of ciliates by G. A. Antipa, who highlights the parasite – prey system of *Didinium* – *Paramecium* and addresses questions of ciliate chemoattractants, and Ciliate physiology involving ingestion, digestion and expulsion by Klaus Hausmann, a noted specialist in this field. This chapter aptly combines early observations using light microscopy with recent data on these processes and structures. The cell biology of ciliates, which consists of two sub-chapters (Vesicle Trafficking in *Paramecium* and Ciliate Mating Types and Pheromones) comprises a significant portion of the book (49 pp.). The first sub-chapter (by H. Plattner) expertly summarizes ciliate membrane biology and the physiological and biochemical basis of membrane trafficking. The sub-chapter on ciliate pheromones (Luporini et al.) is an authoritative overview of the molecular components involved in cell-to-cell communication in ciliates and of the receptors involved. A substantial portion of the book (around 50 pages) is devoted to motility, the central issue for organisms with cilia and flagella, and consists of three subchapters that address special aspects of cilia and flagella motility: "Encounters with Cilia" by M. A. Sleight discusses beat patterns of cilia, fluid dynamics and control of ciliary activity; "How do Protists Keep Up" (H. Machemer) reviews spatial parameters and orientation in ciliate movements; and "Ctenophores and Termites – Systems for Motility" (S. L. Tamm) is a highly innovative view of how the complex flagella and cilia of termite flagellates and ctenophores are coordinated, how cilia, flagella and their basal bodies develop, and how a unique eukaryotic rotary axostylar motor (present in cells of some termite flagellates), actually functions. Another portion (25 pp.) of the book is devoted to Taxonomy and Systematics and emphasizes the significance of organization and phylogeny of ciliate kinetids and their adjoining cortex elements (D. H. Lynn). Of special significance is a chapter by O. Maestrup dedicated to the history and current status of the exploration of protistan flagella, specifically in algal protists. The sixth thematic subject of this book is symbiosis (48 pp.), which is covered in three sub-chapters: the first one covers the common alga *Chlorella*-ciliate and *Holospora* (an unusual bacterial invader of ciliate macronucleus)-ciliate relationships (M. Fushima & Y. Kodama); in the second, the entire spectrum of prokaryotic endosymbionts in ciliates is treated (H. D. Goertz); and the third, an in-depth discussion of the eukaryotic symbionts of termites and their associated prokaryotic associates, titled "Symbionts of Symbionts" (R. Radek & F. H. Strassert). Biodiversity is discussed in the seventh chapter of this book, which reports the diversity of organisms (especially flagellates) that occur on the floors the world's deepest oceans (K. Hausmann). The closing chapter of the book, aptly titled "Retro- and Prospective, Five decades of research in Protistology – what we have learned" is authored by Jens Boenigk which is followed by the Curricula Vitae of the contributors.

What does this book provide the reader? First of all, one should appreciate that this book, though oriented to cilia and flagella and to those organisms equipped with these locomotory organelles, actually covers a multitude of thematic subjects that are presently being actively studied in the field of protistology. It should also be recognized that the individual chapters and subchapters are presented by preeminent specialists in their respective fields and thus provide the reader with an authoritative review of the literature in these fields. Currently the market for science books is dominated by publications that address a very narrow and extremely specialized thematic aspect of science and, therefore, one should appreciate and welcome a text that provides the reader with a comprehensive and comparative view of protistan biology. Schweizerbart Publishers should be commended for publishing book that is of high quality and contains abundant and excellent pictorial material.

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