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Book Review

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NATION, J. L. 2007. Insect Physiology and Biochemistry. Second Edition. ix + 544 pp. CRC Press, Boca Raton. ISBN 978-1-4200-6177-2, hardback, $79.95.

Insect physiology is a specialized discipline within the larger framework of animal physiology. Almost every graduate program in Entomology has a requirement for an insect physiology course and an up to date textbook is required. Students using insects as model organisms should also be interested in this textbook. The textbook primarily describes physiology but there is quite a bit of biochemistry, which adds to the text as a resource. Physiology and biochemistry should be taught together; in order to understand physiology the biochemistry behind the physiology must also be understood. This 2nd edition textbook does a nice job of presenting information to students.

The 2nd edition of course has been updated. Each chapter has received some updating with most noticeable improvements to the figures. The font has not changed but a better paper has been used to make the text and figures easier to read. The front cover might even be more visually appealing to some, although the content is what is important. In addition several chapters have been added to improve the 2nd edition. One is on diapause and one about immunity. These were added in response to suggestions made by reviewers of the first edition and are important aspects to include in a text on insect physiology. Studies on diapause have occurred for quite some time, but more recent insights into the molecular mechanisms behind diapause were also included. Insect immunity is an area of insect physiology that is currently receiving a considerable amount of research attention. This chapter provides students with an overview of this important topic. One aspect that could have received more attention is the regulation of cellular immunity, especially regarding the involvement of prostaglandins. The inclusion of this chapter is important to help students understand the role immunity plays in not only defense against foreign organisms, but also how parasitoids defeat the immune system of a host and the interaction of vertebrate pathogens with vector insects.

Other changes that have improved the second edition are the expansion of chapters on vision and flight. The first edition covered flight within a chapter on muscles. Treating flight in a new chapter indicates its importance, especially with recent advances in understanding flight and the engineering advances in copying insect flight for robotics. The same changes were made with vision. Vision is another active area of insect physiology where a considerable amount of new knowledge has been gained. Especially using honeybees as a model insect to illustrate how vision is important in behavior.

As with any textbook some of the information becomes out of date with new discoveries. For example the hormone bursicon has been identified recently. In fact, very recent efforts in peptide hormone discoveries and identification of corresponding receptors, makes it difficult to provide updated information in a general textbook. Perhaps CRC Press should consider having a web site where new information could be presented on each subject. This would provide students with up to date information between editions of the textbook. The new edition has been improved with the addition of some color plates placed in the middle of the book. Although color plates throughout the text would make any textbook more informative it would also become more expensive. Perhaps CRC Press could provide a website for additional color plates.

I would recommend this textbook to all students, faculty, and other scholars studying insects. The new edition is improved and covers almost every aspect of insect physiology. Every student of entomology should have a course in insect physiology and up to date textbooks are required to help teach these courses. James Nation has taught insect physiology and other courses for quite some time and has incorporated that knowledge into this textbook. The references at the end of each chapter are invaluable to new students and old who want to find out more information about certain topics. As more biologists become interested in insects as more genomes are sequenced they will want to know more about how the genes they are studying fit into the physiology and biochemistry of insects in general. Control measures based more on the specifics of insect physiology will also be developed in the future and background information will be required to exploit these technologies. This textbook will provide that background information.

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