*Insect Biochemistry*

Outline Studies in Biology

by H. H. Rees
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The fundamental Unity of Biochemistry is one of the truisms that is impressed upon students early in their careers, maybe summarized in the aphorism that what is true for *Escherichia coli* is usually true for Elephant. The student is then told that, in truth, things are rather more interesting than this bland uniformity might suggest since Nature has evolved all sorts of ingenious modifications and elaborations of the basic pattern. Since these occur in different life forms, one should not restrict one's studies merely to those groups symbolically represented by *E. coli* and elephant but should take a broader view. Students would do well to give a high priority to the insects, not only because of their economic importance (there must surely be some nice pickings for biochemists in the multimillion dollar industry devoted to trying to kill insects) but also because insects show some very remarkable and fascinating biochemistry. The present book is an ideal one for the student because it concentrates on some biochemical aspects in insects which differ from the conventional pattern and does so in an interesting and clear manner in about 60 pages – which is about the right length for the hard-pressed student for whom a really comprehensive multi-volume work would be quite inappropriate.

Some distinctive features of metabolism are considered first. For instance, insect flight muscle is a remarkable tissue since it shows the highest respiratory rate of any tissue and the catabolic control is such that the glycolytic rate can show a 100-fold increase from rest to flight. It is good for the student who expects glucose to be the fuel for muscle to find that the tsetse fly uses proline and that the oxidation of 1 molecule of proline to alanine can yield 14 molecules of ATP. The sclerotisation of cuticle is next discussed and provides a good example of the control of a metabolic pathway by hormones. This leads to the third chapter of 22 pages devoted to the hormonal control of development with a discussion of the biosynthesis, metabolism and interaction of the moulting, juvenile and brain hormones and how they exert their action. The author reminds us that it is noteworthy that most basic ideas behind current theories of the molecular mode of action of steroid hormones were derived originally from work on ecdysone, the insect moulting hormone. The 'puffs' produced on polytene chromosome bands in *Drosophila* are something the student should know about. He should not forget too that the rediscovery of the cytochromes by David Keilin was a direct consequence of work in insect biochemistry. The final two short chapters deal with insect pheromones, versatile agents forming a communication system external to the insect. The pheromones can be used as sexual attractants at a distance, as alarm signals, calls to aggregation, trail laying and so on. The possible use of hormones and pheromones in insect control is then discussed.

The publisher says the book is aimed at senior undergraduate and graduate students from various disciplines including biochemistry, biology, environmental biology, genetics, insect physiology and entomology. Such people should find this book useful and instructive and it is warmly recommended. A convenient list of references and suggestions for further reading follows each chapter.

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