pest management is a compilation of several studies that support the ecological relationship of crop-pest management. This approach advocates that agriculture has evolved rapidly in time and space and this has affected the insect–plant food association, including the natural enemies of insect herbivores. Any desirable effect in pest management, therefore, requires adequate understanding of the agriculture landscape and conditions associated with its development. An alternative approach to this is top-down forces that emphasize use of biological control agents in pest management. Both approaches contribute to integrated pest management in large parts of tropical Asia and Africa.

Cicadas (13- and 17-yr periodicals) are among the most studied insects in evolution and ecology. Sound character, behaviour and long periodicity of their mass emergence in most species make these insects special in their host plant association, biogeography, and living in allopatric, sympatric or parallel species groups. Occasional inter-species breeding in the long rhythmic cycle showing minute to very small variations in sound pitch allows individuals of closely related species to share a common environment. Results have shown parallel evolution in such species. This and other major reviews on cicadas in general, and *Megacicada* species in particular, suggest reproductive boundaries and reproductive character displacement as a strong means of maintaining reproductive isolation. Most species are sympatric, with widely separated species being allopatric showing continuum in their distribution range. Gene-flow studies among sympatric or allopatric populations tend to be directional, and this shows why cicadas use sound as a major character of isolation.

A review of this volume will be incomplete without highlighting the article by Walsh *et al.* on insecticide resistance evolution among heliothis insects. Results from studies in Australia, China, India, the United States and parts of South America on six species clearly suggest that *Helicoverpa armigera* is the most resistant on almost all crop, including *Bt*-cotton and *Bt*-brinjal, followed by lower level of resistance recorded in *Helicoverpa zea* and four other species. None of these species was a serious crop pest before the introduction of chemical pesticides in early 1950s and 1960s. However, with the spread of agriculture and application of chemical insecticides, populations of these insects developed detoxifying genes that provided them resistance against insecticides and plant defence compounds. Obviously, these insects possess genetic and biochemical abilities that make them tolerant to ever-changing chemical pesticides and crops embedded with toxins produced by *Bacillus thuringiensis*. Results show that crop selection accompanied by application of new generation plant-origin insecticides, to some extent, provide answers to detoxifying enzymes present in the resistant populations. The authors claim that it is important to rely more on crop management with careful monitoring of alternative refuse plants that can reduce population incidence.

This volume of the *Annual Review of Entomology* is a treasure of advances in knowledge in insect science and deserves appreciation for the contributions by the editor, co-editors and various authors.

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Learning GIS using Open Source Software: An Applied Guide for Geo-spatial Analysis. Kakoli Saha and Yngve K. Frøyen. Francis Group, 4 Park Square, Milton Park, Abingdon, Oxon OX 14 4RN, UK and Routledge, an imprint of Taylor & Francis Group, 605, Third Avenue, New York, NY10158, USA. 2022. xiv + 226 pages. Price: £ 120.00.

Open-source GIS platforms such as quantum GIS (QGIS) are widely used nowadays. As open-source platforms offer most of the functionality of the pricy commercial packages, academic programmes teaching GIS concepts and usage have benefitted from such open-source packages in the classrooms and laboratories. In addition to academia, several Government organizations and non-governmental organizations have deployed their spatial databases and planning platforms using resources from open-sources, and the number of organizations adopting open source solutions is steadily increasing.

In this context, this book addresses an important and relevant need by providing learners with an excellent reference for a complete exposure to the fundamental GIS concepts through the use of open-source GIS platforms. A key feature of the book is that, in addition to the core concepts, the steps required to implement the concepts through QGIS are documented in a tutorial form. This enables a reader to get hands-on practice on the concepts, which is important for the effective learning of GIS.

The contents of the book are well structured. After the introduction and coverage of the history of GIS in India, each of the key concepts such as special referencing, generation of data, analysis techniques, etc. required to implement a GIS solution is covered in a logical sequence. The coverage of the concepts is appropriately detailed for students and practitioners who are learning GIS for the first time. The stepwise instructions and extensive illustrations make it easy for the learners to execute each step and learn about the usage of the platform as well as the underlying requirements. As only broad view of concepts is presented for learners, for those who need more detailed information on the concepts, references are specified at the end of each chapter.

In addition to covering the concepts and usage, the final chapters of the book present applications of the open-source platform for access analysis and location planning. Although the applications of GIS are multifarious, these chapters give reasonable exposure to a learner on the process of analysing and transforming data from their basic representation to the integrated format needed for decision and policy support.

While there are other books on QGIS, they mainly focus on the effective usage of the platform and not on the fundamental concepts. As this book integrates both aspects at an introductory level, it will be a valuable resource for teachers, students and practitioners looking for a structured introduction to GIS concepts and its usage through an open-source platform.

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