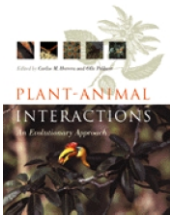
Book Review

Plants and animals, forever entangled

Plant–Animal Interactions – An Evolutionary Approach edited by C.M. Herrera and O. Pellmyr. Blackwell Science, 2002. £35.00 pbk (xi + 313 pages) ISBN 0 632 05267 8

Lars Chittka

School of Biological Sciences, Queen Mary, University of London, London E1 4NS, UK



'It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about…and to reflect that these elaborately structured forms…dependent on each other in so complex a manner, have all been produced by laws acting around us,' says Darwin in the final paragraph of *The Origin of Species*. In somewhat more contemporary language, the blurb of *Plant–Animal Interactions* announces 'Attraction, deception, defence, escape and tolerance', but what sounds a bit like the subtitle of a soap opera is in fact referring to the turbulent marriage between animals and plants. Aimed at graduate students, this book shows, however, that studying the intricacies of animal–plant interactions can be substantially more entertaining than those between soap-opera actors. The editors have brought together a team of internationally renowned scholars to write nine chapters about one of the most mature and, simultaneously, most dynamic fields of evolutionary ecology.

Peter W. Price opens the topic with a discussion about the nature and diversity of animal–plant interactions, and how the multiple types of interaction have forged yet more diversity at the species level. He adds an original slant by pointing out that flight is a key innovation in shaping these interactions: most terrestrial organisms – plants or animals – fly at some stage (e.g. plants as pollen or seeds; and, among the animals, birds, bats and insects, as the most speciose class), and many animal–plant interactions only make sense in the light of flight. Conrad C. Labandeira then presents the rich array of paleobiological and phylogenetic tools used to open windows into the past of the relationship between plants and animals. For example, phylogenetic analyses revealed how insects probably saw colors in the Devonian, long before colored flowers first occurred [1].

There follows a focus on antagonism (insects and mammals as herbivores, phytoparasites and granivores, and plant strategies for deterring the unwanted vegetarians). A convincing point is made that the arms race between herbivores and the defence machinery of affected plants has been the very reason for the extraordinary diversity in all of the groups involved.

The book then turns to mutualism, with the editors each contributing a piece; Olle Pellmyr discussing pollination, and Carlos Herrera, seed dispersal. The relationship between ants and plants, as described by Andrew J. Beattie and Lesley Hughes, is especially intricate and fascinating. Ants pollinate flowers and disperse seeds, they build gardens and protect plants from their foes. In turn, the plants offer the ants various kinds of food and, sometimes, even a home, as exemplified by the ant-acacias of Costa Rica and East Africa.

Finally, John N. Thomson identifies several key avenues for the next generation of scientists interested in the tangled web of plants and animals. Dedicating a whole chapter to the future is an interesting idea, but can we actually predict the course of science? Predictions are possible for a short time frame, largely because everyone is jumping on everyone else's bandwagon, but has anyone ever evaluated the 'science forecast' ten years down the road? Nevertheless, this chapter provides several extremely useful starting points.

The chapters are a bit heterogeneous in style, with some having glossaries and/or useful 'future directions' sections, whilst others do not. However, the quality of the chapters is consistently high, and all are easily intelligible, offering comprehensive and up-to-date reviews of their respective fields, making the book extremely valuable for teaching. The final sentence in Price's chapter reads '…we can still learn from Darwin's example – first the great naturalist, then the detector of pattern, then the formulator of mechanisms, and finally the creator of the central theory for life'. Few of us are destined to go through all these stages, but *Plant–Animal Interactions* will certainly be a useful tool for students of biology wishing to be successful in at least one!

References

1 Chittka, L. (1996) Does bee colour vision predate the evolution of flower colour? *Naturwissenschaften* 83, 136–138

Corresponding author: L. Chittka (l.chittka@qmul.ac.uk).

 0169-5347/03/$ - see front matter PII: S0169-5347(02)00017-4