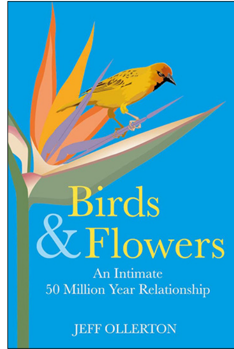
ORNITHOLOGY

Birds and Flowers: an Intimate 50 Million Year Relationship

By Jeff Ollerton. 2024. Pelagic Publishing. 336 pages and 28 colour illustrations, 39.00 CAD, Hardcover, 25.99 CAD, E-book.



While hummingbirds are the most recognized bird family to visit flowers for nectar or insects (at least in the Western Hemisphere), they are just a fraction of the avian species that do so: researchers have documented at least 1390 species (or 12.5% of known bird species) that visit flowers in ways that suggest they might be pollinators (p. 20). The list includes parrots, pigeons, doves, warblers, and even woodpeckers. Sunbirds are common pollinators in Asia, Africa, and Australia, but for no obvious reason, bird pollination of native plants in Europe is rare. Scientist and author Jeff Ollerton estimates that about 20 000 plant species (or 6 to 7% of known plant species) are likely to be bird-pollinated, wholly or in part (p. 46). In *Birds and Flowers*, he touches on three themes: the evolution and subsequent diversification of the bird–flower relationship, the details and intricacies of the ecology of these interactions, and how humans have influenced these interactions.

As suggested in the book's subtitle, the relationship between birds and flowers goes back at least 50 million years. Nectar feeding (nectarivory) evolved at least three times, while flower pollination as an outcome of that lifestyle has evolved in different species much more frequently. Ollerton is particularly interested in the question of how effective some of the non-specialist nectar-feeding birds are at depositing pollen on the stigma of specific plants. If that doesn't happen, then they are just nectar robbers. Observation alone can't always confirm whether pollination occurs when a bird visits a plant. More recent experiments involve covering flowers with netting to only allow certain flowers to be visited, counting the pollen grains before and after each visit, and then counting the seeds that are produced. This provides confirmation of pollination but is very time-consuming and done for very few species.

Ollerton describes collaborating with bird banders to collect pollen from the beaks of birds. In 2019 I was a volunteer bander at Un poco del Chocó, a private nature reserve in Ecuador. One of our projects was capturing hummingbirds for a graduate student, who used a gel syringe to collect pollen from beaks and feathers and spread it on a microscope slide. Back in the lab, she identified the pollen grains to species, a step towards understanding the bird–flower relationship in that area.

Researchers have identified some general characteristics of bird-pollinated flowers: they are often red, orange, magenta, or rose-coloured; they often have larger amounts of more dilute nectar than insect-pollinated flowers; and their sexual parts usually extend farther beyond the mouth of the flower tube, leaving no place for insects to land. But Ollerton questions whether an over-reliance on this set of flower traits (a pollination syndrome) results in a partial and/or oversimplified understanding of flower evolution, thus missing out on important aspects of this ecological relationship.

While we tend to assume that it is the preferences of pollinators that apply evolutionary pressure on flowers to look a certain way and provide certain rewards, the author points out that plants are not passive in this relationship: "they possess behaviours that can manipulate their floral guests in ways that are more advantageous for plant than animal" (p. 92). Interactions between pollinators and their flowers can also vary geographically and over time. A flower's lifespan is negatively correlated with the rate of visitation by pollinators—ones that are infrequently visited must stay open longer. More specialisation (e.g., one species of hummingbird pollinating one species of flower) occurs when there are lots of resources, but generalisation occurs when resources are scarce.

Ollerton looks at the human connection to the birds and flowers relationship in a few ways. He chronicles ancient and Indigenous peoples' representation of bird–flower interactions in pottery, paintings, and stories, and later European explorers' colonial observations and writings. Pollinators enhance the health of human populations by increasing crop production, but on a global scale birds play a minor role in the pollination of food plants. However, at a local scale, and for wild plants that are harvested, birds can play a very important role. In the final two chapters, Ollerton discusses conservation challenges facing pollinating birds (about 15% of hummingbird species are declining in population or distribution [p. 223]) and highlights a few success stories.

There are 19 relatively short chapters in *Birds and Flowers*. Some have provocative and attention-grabbing titles, such as Hitchhikers, Drunks and Killers

(Chapter 10), and Bad Birds and Feral Flowers (Chapter 17). There is an appendix of common and scientific names of species mentioned in the book and 38 pages of references by chapter.

This book stimulates the reader to consider more than superficial relationships in the natural world, to look below the surface of our observations. As Ollerton says, there are “more questions than birds, more puzzles than plants” (p. 245).

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