The wonders of orchids: Beautiful, smelly and sexy

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THERE is a tendency to think of Charles Darwin as a zoologist. Certainly *On the Origin of Species* begins with a long section on pigeons, and animals from the Galapagos played key roles in the great man's thinking about evolutionary processes.

But Darwin was powerfully interested in the botanical side of life. One of his mentors at Cambridge was the notable botanist John Stevens Henslow, and Joseph Hooker, a lifelong friend, was director of the Royal Botanic Gardens, Kew. Of the 10 books that Darwin published after *On The Origin*, six were on botanical topics, and the very first of these was on orchids.

Published in 1862, *On the Various Contrivances by which British and Foreign Orchids are Fertilised by Insects* was partly derived from Darwin's studies, but also brought together the observations of a huge number of people with whom he corresponded. This is a pattern of cooperative science he began when studying barnacles and continued throughout his life.

The 150th anniversary of *Contrivances* was celebrated with a symposium, which organisers Retha Edens-Meier and Peter Bernhardt expanded into *Darwin's Orchids*. The book is divided into the same number of sections as there were chapters in *Contrivances*, with each section dealing with a topic from an original chapter.

This allows the book's 30-odd authors to show just how far 150 years of study and thinking have taken us. There are sections on British and European orchids (the fly orchid, *Orchis insectifera*, was Darwin's favourite), orchids from the drylands of southern Africa and Australia, and the

extravagant and glorious panoply of rainforest and cloud forest orchids. Finally, just as Darwin did, the book takes a long, lingering look at the pollination biology of slipper orchids, a truly flamboyant group even by the High Baroque standards of the family.

An additional chapter considers the conservation impact of climate change on orchid pollination biology. This was not something Darwin had to worry about: orchid-mania reigned in the 19th century when collectors would cut down trees to access prized specimens or uproot whole colonies of a sought-after species, just to deny rivals.

Darwin's Orchids is full of surprises: plants of the wonderfully named *Dracula* genus (one is pictured above) are pollinated by fungus gnats, attracted by a blob of tissue that looks and smells like the fungus on which they normally lay eggs; *Orchis pauciflora* puffs out the pheromones that bumblebee queens use to mark males, while *Cryptostylis* orchids mimic female wasps, transferring pollen when male wasps attempt to copulate with them. Many orchids have no nectar, effectively being just bigger and brighter versions of flowers, like violets, that do.

There is also plenty about Darwin: the young explorer as well as the somewhat older man, fussing over specimens in his greenhouse. His orchid work and knowledge are given historical context, while those responsible, for our progress in understanding since then, like Swedish entomologist Bertil Kullenberg, also receive deserved attention.

This book will delight all those who have ever paused in a garden centre and, gazing at some extraordinary orchid, wondered, "Just what was evolution thinking?" Well, now, to some degree, we seem to know. Darwin would surely have been amazed by all the progress outlined here, and fascinated by such a wealth of new knowledge.

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