



AGENTS OF POLLEN DISPERSAL (BIRDS)

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BIRDS

Because the study of mechanisms of pollination began in Europe, where pollinating birds are rare, their importance is often underestimated. In fact, in the tropics and the southern temperate zones, birds are at least as important as pollinators as insects are, perhaps more so. About a third of the 300 families of flowering plants have at least some members with ornithophilous (“bird-loving”) flowers—i.e., flowers attractive to birds. Conversely, about 2,000 species of birds, belonging to 50 or more families, visit flowers more or less regularly to feed on nectar, pollen, and flower-inhabiting insects or spiders. Special adaptations to this way of life, in the form of slender, sometimes curved, beaks and tongues provided with brushes or shaped into tubes, are found in over 1,600 species of eight families: hummingbirds, sunbirds (see The Rodent That Acts Like a Hippo and Other Examples of Convergent Evolution), honeyeaters, brush-tongued parrots, white-eyes, flower-peckers, honeycreepers (or sugarbirds), and Hawaiian honeycreepers such as the iiwi. Generally, the sense of smell in birds is poorly developed and not used in their quest for food; instead, they rely on their powerful vision and their colour sense, which resembles that of human (ultraviolet not being seen as a colour, whereas red is). Furthermore, the sensitivity of the bird’s eye is greatest in the middle and red part of the spectrum. This is sometimes ascribed to the presence in the retina of orange-red drops of oil, which together may act as a light filter.

Although other explanations have been forwarded, the special red sensitivity of the bird eye is usually thought to be the reason why so many bird-pollinated flowers are of a uniform, pure red colour. Combinations of complementary colors, such as orange and blue, or green and red, also are found, as are white flowers. As might be expected, bird flowers generally lack smell and are open in the daytime; they are bigger than most insect flowers and have a wider floral tube. Bird flowers also are sturdily constructed as a protection against the probing bill of the visitors, with the ovules kept out of harm's way in an inferior ovary beneath the floral chamber or placed at the end of a special stalk or behind a screen formed by the fused bases of the stamens. The latter, often so strong as to resemble metal wire, are usually numerous, brightly coloured, and protruding, so that they touch a visiting bird on the breast or head as it feeds. The pollen grains often stick together in clumps or chains, with the result that a single visit may result in the fertilization of hundreds of ovules.

In the Americas, where hummingbirds usually suck the nectar of flowers on the wing, ornithophilous flowers (e.g., fuchsias) are often pendant and radially symmetrical, lacking the landing platform of the typical bee flower. In Africa and Asia, bird flowers often are erect and do offer their visitors, which do not hover, either a landing platform or special perches in the form of small twigs near the flower. Pollinating birds are bigger than insects and have a very high rate of metabolism. Although some hummingbirds go into a state resembling hibernation every night, curtailing their metabolism drastically, others keep late hours. Thus, in general, birds need much more nectar per individual than insects do. Accordingly, bird flowers produce nectar copiously—a thimbleful in each flower of the coral tree, for example, and as much as a liqueur glassful in flowers of the spear lily (*Doryanthus*). Plants bearing typical bird flowers are cardinal flower, fuchsia, red columbine, trumpet vine, hibiscus, strelitzia, and eucalyptus, and many members of the pea, orchid, cactus, and pineapple families.