Chapter 67

Extended Phenotype

Rothschild (1972, 1986) proposed that aposematic insects seem to defend certain plants from large herbivores. Accordingly, when various poisonous aposematic insects aggregate on poisonous plants, they add to the plant's aposematic odor and possibly also to its coloration. This is a type of plant-insect mutualism, a case of an extended phenotype, which deserves much more descriptive, theoretical and experimental studies.

This line of thinking was continued by Lev-Yadun and Ne'eman (2012) when they extended their hypothesis of defensive visual bee- and wasp flower mimicry to many other plants that produce highly rewarding bee-pollinated flowers that attract many bees, and proposed that the sight and sound of massive pollinating bee activity may deter herbivore insects and vertebrates from such plants, especially from their flowers, in the critical time of peak flowering season. The well-known deterrence of caterpillar feeding and movement by wasp and bee buzz (Tautz and Markl 1978; Tautz and Rostás 2008), and the great fear of bees by African elephants (Vollrath and Douglas-Hamilton 2002; King et al. 2007, 2009, 2011) are strong indications of the potential of such a defense. Lev-Yadun and Ne'eman (2012) also proposed that if experiments show that pollinating bees deter herbivores, some of the costs of attracting bees by flowers should be regarded as the cost of defense from herbivory rather than pure costs of reproduction. However, this hypothesis still deserves significant field observations and experimental work.