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Ehrlich P R & Raven P H. Butterflies and plants: a study in coevolution. *Evolution* **18**:586-608, 1964.
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The relationships of butterflies and their larval food plants were described and the patterns were hypothesized to result from a reciprocal evolutionary process for which the term 'coevolution' was coined. The primary function of secondary plant chemicals was claimed to be defense against herbivores. [The *Science Citation Index*® (*SCI*®) and the *Social Sciences Citation Index*® (*SSCI*®) indicate that this paper has been cited in over 295 publications since 1964.]

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"Our work began over the coffee table when I remarked to Peter Raven that it seemed strange that the *Euphydryas* butterflies that were the subject of my ecological research fed on plants of the families Plantaginaceae and Scrophulariaceae. Peter thought that combination not strange at all, and we began to have daily discussions in which I would describe patterns of food-plant use in butterflies, and he would see what sort of botanical 'sense' they made.

"We began ransacking the literature for data on which plants were eaten and for information on the common characteristics of those plants. The diets of butterflies turned out to be better documented than those of any other large group (12,000-15,000 species) of herbivores. Something was known of the food plants of roughly half of the genera, largely because of the interest of amateurs in raising butterflies in order to get perfect specimens for their collections. It was not long before we realized that the so-called 'secondary compounds' of the plants played a major role in the interactions.

"From that point on, it was a matter of brainstorming between two close colleagues, both evolutionists, one with much experience with butterflies and the other with plants. We did the work with a rising sense of excitement, as we suspected that coevolution was generally an underrated process. Zoologists tended to view plants almost as part of the physical environment; too many parasitologists did not consider the evolution of hosts; and so forth.

"I believe that our paper has been so widely cited because it provided for the first time a detailed discussion of the evolutionary relationships between two large, ecologically intimate groups of organisms. While various of the ideas can be found as far back as the writings of Darwin, and other people had suggested the defensive nature of plant chemicals, no one had put the picture together in this way before and discussed its manifold implications.

"The paper certainly helped spark the development of the now vast field of plant-herbivore coevolution and interest in the process of coevolution in general. Some idea of the ways in which this area of population biology has developed over the past two decades can be gained from a perusal of the excellent new volume edited by Futuyma and Slatkin.[1]

"Quite naturally, some of the ideas in our paper have been criticized, and some were probably quite wrong. Nonetheless, it seems to have stimulated the thinking of a great many people. It is probably the most-cited article either Peter or I have ever published, but that is not the thing that interests us most about it. Unlike our other work, it was done entirely around the coffee table and in the library—neither of us looked at an organism, living or dead, in the course of the work. Therefore our advice to young scientists, should they wish to publish a highly cited paper, apparently ought to be 'study books, and not nature!' "

1. **Futuyma D J & Slatkin M,** eds. *Coevolution*. Sunderland, MA: Sinauer Associates, 1983. 555 p.