

Auclair J L. Aphid feeding and nutrition. *Annu. Rev. Entomol.* 8:439-90, 1963.
[Research Station, Research Branch, Canada Dept. Agriculture, St. Jean, Québec, Canada]

This paper reviews the physiological and biochemical features of aphid feeding and nutrition with occasional reference to the morphological, behavioural, and ecological aspects. A discussion is also included on the symbiotes harboured by aphids and their contribution to the nitrogen economy of these insects. [The SCJ® indicates that this paper has been cited in over 125 publications since 1963.]

Jacques L. Auclair
Departement de Sciences Biologiques
Université de Montréal
Montréal, Québec H3C 3J7
Canada

January 12, 1984

"Aphids, or plant lice, are a group of plant-sucking insects that include close to 4,000 species. They are important in the agriculture and forestry of the temperate zone because they feed mainly on the phloem sap of plants, thus depriving the latter of valuable products of photosynthesis and metabolism. Furthermore, aphids represent one of the most important groups of vectors of virus which produce debilitating diseases in plants.

"My study of aphids started when I was a graduate student during World War II. I was introduced to this fascinating group of insects by my friend and colleague J.B. Maltais, who had done some pioneer work on aphid resistance in pea plants at the Canada Agriculture Research Station, St. Jean, Québec. After some 15 years of research in that field, I realized that information on aphid feeding and nutrition was scattered in the literature and there was a need for a comprehensive and critical review of

the subject. Thus, my paper was originally planned and prepared as a monograph to be published either separately, or in a scientific periodical. However, knowledge of its existence became known to the editorial staff of the *Annual Review of Entomology*, and they kindly invited me to publish it in their annual book.

"I believe that my paper is frequently cited because it offered an up-to-date critical review of fundamental investigations on aphid feeding and nutrition by workers from different countries. This review represents a useful source of information to entomologists and plant pathologists interested in host-plant resistance to aphids and virus transmission by aphids. It is also of interest to insect physiologists in general, as it provides a collection of basic qualitative and quantitative data on the physiology and biochemistry of aphids. Another reason for its frequent citation is the timeliness of its publication, which coincided with the beginning of a large expansion in the investigations on aphid physiology, ecology, and control by host-plant resistance, as illustrated by the high number of publications and monographs that appeared subsequently on these subjects. The years 1962-1963 also heralded the achievements, published for the first time, of a new technique for the artificial rearing of aphids divorced from their host plants, that is, by feeding them on chemically defined (holidic) diets.^{1,2} This provided a novel approach to further studies on aphids.

"Knowledge on the subject of aphids, their biology, natural enemies, and control, is being summarized in a two-volume monograph now in preparation by a number of aphidologists, including myself, under the editorship of P. Harrewijn and A.K. Minks of the Research Institute for Plant Protection, Wageningen, the Netherlands. This monograph is one of a series being undertaken by specialists on world crop pests, and it includes some chapters related to my 1963 review. It should be published in 1985."

1. Mittler T E & Dadd R H. Artificial feeding and rearing of the aphid, *Myzus persicae* (Sulzer), on a completely defined synthetic diet. *Nature* 195:404, 1962.
2. Auclair J L & Cartier J J. Pea aphid: rearing on a chemically defined diet. *Science* 142:1068-9, 1963.