

Current Topics in Microbiology and Immunology

Ergebnisse der Mikrobiologie und Immunitätsforschung

Edited by

*W. Arber, Genève · W. Braun, New Brunswick · F. Cramer, Göttingen · R. Haas, Freiburg ·
W. Henle, Philadelphia · P. H. Hofschneider, München · N. K. Jerne, Frankfurt ·
W. Kikuth, Düsseldorf · P. Koldovsky, Prague · H. Koprowski, Philadelphia · O. Maaløe,
Berkeley · R. Rott, Gießen · H.-G. Schweiger, Wilhelmshaven · M. Sela, Rehovoth ·
L. Syruček, Prague · P. K. Vogt, Denver · E. Wecker, Würzburg*

Volume 42



Springer-Verlag New York Inc. 1968

Insect Viruses

Edited by

Karl Maramorosch

With 34 Figures



Springer-Verlag New York Inc. 1968

*Karl Maramorosch, Ph. D., Boyce Thompson Institute for Plant Research,
1086 North Broadway, Yonkers, N.Y. 10701/USA*

ISBN-13: 978-3-642-46117-0 e-ISBN-13: 978-3-642-46115-6
DOI: 10.1007/978-3-642-46115-6

All rights reserved. No part of this book may be translated or reproduced in any form without written permission from Springer-Verlag. © by Springer-Verlag Berlin · Heidelberg · 1968. Library of Congress Catalog Card Number 15-12910.
Softcover reprint of the hardcover 1st edition 1968

The use of general descriptive names, trade names, trade marks, etc. in this publication, even if the former are not especially identified, is not to be taken as a sign that such names, as understood by the Trade Marks and Merchandise Marks Act, may accordingly be used freely by anyone. Title No. 4690.

Introduction

This volume contains seven chapters, based on papers presented at a Symposium on Insect Viruses, held in conjunction with the 67th Annual Meeting of the American Society for Microbiology in New York, N. Y., on 30 April—4 May, 1967. The Symposium was organized to bring together outstanding workers interested in various areas of insect virology, and allow an opportunity for a discussion of problems, approaches, and methods that would lead to further progress in basic and applied research. One of the principal reasons for holding the Symposium at this time was the feeling that the divergent areas of research, up to now studied separately by entomologists, medical and public health workers, geneticists, and plant pathologists, would be brought together, crossing the artificial borders and finding new, exciting and inspiring vistas. Insect viruses provide a rare opportunity to get acquainted with the work and methods of investigators in such related and yet distant fields.

Following the symposium, a decision was made to publish the papers in a single volume, extending the contents to provide a complete and scholarly review of each subject. Since viruses affecting insects have received little attention until recent years, it was felt that a fully documented presentation of diverse areas of insect virology merited publication. The invited authors, all recognized authorities in their respective fields, prepared their contributions in such a way that each is a concise unit. Typical viruses that attack and kill insects are discussed in two chapters. The first is by GORDON R. STAIRS ("Inclusion-type Viruses"), and the second by C. VAGO ("Non-inclusion Viruses"). Arthropod-borne animal viruses that infect both vertebrates and blood-sucking arthropods constitute, by far, the largest group of known vertebrate viruses, with over 200 different species described by 1967. This chapter ("Arboviruses") has been prepared by ROY W. CHAMBERLAIN.

The unique congenital carbon dioxide sensitivity of fruit flies, caused by a virus now known to be very similar to that causing vesicular stomatitis, but until recently studied almost exclusively as a genetic trait, has been covered by ROBERT L. SEECOF ("Sigma Virus of *Drosophila*"). The group of plant-pathogenic viruses that infect plants, as well as insects, sometimes causing fatal insect diseases, has been reviewed by KARL MARAMOROSCH ("Plant-Pathogenic Viruses in Insects"), who acted as the convener of the 1967 Symposium and editor of this volume.

An account of the increasingly popular techniques and achievements in insect tissue culture has been given by J. L. VAUGHN ("Insect Viruses in

Tissue Culture”). “Viruses—Living Insecticides” is the title of the last chapter, written by C. M. IGNOFFO.

The subject of insect viruses is of considerable scientific interest and importance, and one that appeals to an audience recruited from students of entomology, human and veterinary medicine, virology, genetics, biochemistry, zoology, plant pathology, microbiology, and other branches of biology. Those who attended the Symposium and participated in the formal and informal discussions realized how the details or aspects of a particular group of insect viruses may have a bearing on other groups. It is hoped that the publication of the revised and enlarged papers will add to the success attained by the New York City Symposium, by reaching a much wider audience of biologists and public health officials.

The Editor would like to pay special tribute to Dr. WERNER HENLE, who not only helped in the organization of the Symposium and arrangements with the publisher, but also showed remarkable skill and persuasiveness in obtaining the manuscripts. The Editor also wishes to thank the American Society for Microbiology for help in sponsoring the Symposium, and all of the contributors for their excellent contributions.

January 16, 1968
Yonkers, New York

KARL MARAMOROSCH
Boyce Thompson Institute
for Plant Research

Table of Contents

Inclusion-Type Insect Viruses. By GORDON R. STAIRS. With 6 Figures . . .	1
Non-Inclusion Virus Diseases of Invertebrates. By C. VAGO	24
Arboviruses, the Arthropod-Borne Animal Viruses. By ROY W. CHAMBERLAIN	38
The Sigma Virus Infection of <i>Drosophila Melanogaster</i> . By ROBERT SEECOF. With 2 Figures	59
Plant Pathogenic Viruses in Insects. By KARL MARAMOROSCH. With 6 Figures	94
A Review of the Use of Insect Tissue Culture for the Study of Insect-Associated Viruses. By JAMES L. VAUGHN	108
Viruses—Living Insecticides. By CARLO M. IGNOFFO. With 20 Figures	129
Subject Index	168