

# **Toxins of Animal and Plant Origin**

**Volume 1** Edited by A. de Vries and E. Kochva  
Tel-Aviv University, Israel

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**A. de VRIES and E. KOCHVA**  
*Tel-Aviv University, Tel-Aviv, Israel*

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## PREFACE

The field of research of toxins from various sources, mainly animal, has been active during the last two decades and has resulted in several international meetings, and in a series of original and review publications. There has been rapid progress in this field, not only in its clinical and pharmacological aspects, but also on the cellular and molecular level. The knowledge accumulating is so extensive and intensive that it is imperative from time to time to review together the activities of the numerous laboratories occupied with toxin research throughout the world. Such a survey of the field was made possible by the Second International Symposium on Animal and Plant Toxins held at Tel-Aviv University in February 1970, the proceedings of which are presented here. The participants of the Symposium have covered in their papers not only the results of accomplished studies, but also preliminary findings obtained in their laboratories.

We have included in these volumes both extensive reviews and original technical reports, arranged according to disciplines rather than taxonomy. We have restricted editing to the bare minimum necessary for better comprehension and organisation of the material.

In these tasks we were aided by several colleagues from Tel-Aviv University who read some of the manuscripts, especially Drs. A. Ar, A. Bdolah, S. Ben-Efraim and B. Moaz. Mrs. Ruth Manneberg, the secretary of the Department of Zoology, Tel-Aviv University, took charge of the arranging of the manuscripts and the preparation of the book for the printer and Miss Ziva Yehezkel compiled the subject index. We thank them all for their efforts, and Gordon and Breach of London and their local representative, Miss Miriam Balaban for dealing so patiently and efficiently with the extensive texts and numerous illustrations.

**A. de VRIES and E. KOCHVA**

*Tel-Aviv*

## DEDICATION

The Proceedings of the Second International Symposium on Animal and Plant Toxins, Tel-Aviv, February 1970, are dedicated to the memory of three distinguished toxinologists — Prof. O. G. Cesaire from Dakar, Senegal; Dr. Brisbois from Brussels, Belgium; and Dr. Lauhatirananda from Bangkok, Thailand. All three perished on their way to the Symposium, in the airplane that exploded over Switzerland.

They were humane, brilliant scientists. May their example serve to raise the moral status of mankind, in whose service they died.

**Olivier Georges Cesaire**



Le Professeur Olivier Georges Cesaire, né le 28 mai 1921 à Basse-Pointe, département de la Martinique, a trouvé la mort tragiquement le 21 février 1970 en se rendant à Tel-Aviv pour représenter parmi nous l'Université de Dakar.

Après de brillantes études secondaires faites à Paris, le Professeur Cesaire s'oriente vers la Pharmacie, mais ses études seront interrompues par la deuxième guerre mondiale. Il y participe depuis Alger et sert en qualité de pharmacien auxiliaire pendant les campagnes d'Italie, puis de France de 1942 à 1945. Après la libération il termine en 1946 son diplôme d'Etat de Pharmacien, puis poursuit ses études scientifiques en préparant une licence ès sciences et en soutenant sa thèse de doctorat d'état à Alger en 1950.

Chef de Travaux de Chimie Biologique à Alger de 1947 à 1955, il est ensuite détaché dans un poste équivalent à Dakar. En 1959, il est chargé des fonctions de Maître de Conférences de Chimie Analytique, puis agrégé des Facultés de Médecine et Pharmacie au concours de 1961.

En 1967, il est nommé Professeur titulaire de la chaire de Chimie Analytique et Toxicologie à la Faculté de Médecine et de Pharmacie de Dakar.

Titulaire de nombreuses distinctions honorifiques, Françaises et Sénégalaises, il était membre de sociétés savantes de réputation internationale.

Très tôt il devait orienter ses recherches vers l'analyse biologique, domaine dans lequel il rédigea plus de cinquante publications.

Homme de science certes, mais homme de coeur aussi, il était attentif à tout problème humain qu'il excellait à résoudre avec clarté et modestie. Il laisse dans sa famille, parma ses collaborateurs, ses confrères, ses amis et ses étudiants, un vide profond.

Léopold Brisbois



Léopold Brisbois was among the victims of the explosion of the Swiss-air 'Coronado' that occurred Saturday, February 21, 1970 at Wuerellingen (Switzerland). Born at Schaerbeek on June 1, 1939, married and father of a four year old child, he lived at Dilbeek. In 1962, Mr. Brisbois obtained with distinction the title of technical Engineer of Chemical Industries at the 'Institut des Industries de Fermentation — Institut Meurice Chimie'. After being employed for several months as a research worker at the 'Centre de Recherche des Substances Naturelles' he entered the O.C.D. service as a teacher in a college at Bujumbura. During his stay in Africa he took the examinations required to obtain the certificate of biochemistry at the University of Bujumbura. When he came back to Belgium he worked at 'CPRS — CERIA'. In 1966 he obtained the title of technical Engineer of Chemical Industries and Sciences with the greatest distinction. He presented two works entitled 'Contribution à l'étude des venins d'ophidiens, filtration avec gel moléculaire' and 'Etude analytique des éléments rencontrés dans les venins de serpents'. He planned to present his doctoral thesis at the University of Lille (France) in March, 1970.

Mr. Brisbois devoted his research work to snake venoms and particularly to the Formosan cobra venom

(*Naja naja atra*). He was interested not only in the biochemical aspect (purification of fractions and structural determination) but also in physiology (attenuation of pain and inhibition of malignant cells).

Mr. Brisbois will leave all his colleagues in teaching and research the memory of an intelligent, persevering and courteous man.

#### Dr. Prasit Lauhatirananda



Dr. Prasit Lauhatirananda was born on 15 May 1924 in Prae, a northern province of Thailand. He obtained his medical degree from Siriraj Faculty of Medicine, University of Medical Sciences, in 1946. Immediately after graduation he joined the staff of the Queen Saovabha Memorial Institute, Thai Red Cross Society. His entire professional career was spent at this Institute where he served practi-

cally in all sections, namely, Serum Section, Vaccine Section and Research Section. His last appointment was Chief of Research Section from 1964 to the time of his death.

Dr. Lauhatirananda went abroad on several occasions for training: (1) in BCG vaccine production at the State Serum Institute, Copenhagen, (2) in vaccine and serum production at Istituto Superiore di Sanita, Rome and (3) in biological standardization at the World Health Organization Laboratory, State Serum Institute, Copenhagen. In 1963 he headed a team to demonstrate the extraction of venoms from Thailand poisonous snakes at the International Red Cross Centenary Celebration in Geneva.

After his return from training in biological standardization in Copenhagen, he took charge of the assays of cobra venom and antivenin in collaboration with the World Health Organization. He was the active investigator in the research studies on the effects of radiation on cobra venom, working in collaboration with the Office of Atomic Energy for Peace in Bangkok under a contract with the International Atomic Energy Agency in Vienna. In this connection he participated in both panel meetings arranged by the International Atomic Energy Agency in Bangkok in 1968 and 1969.

Dr. Lauhatirananda met his tragic death on 21 February 1970 in the airplane explosion in Zurich on his journey to Tel-Aviv to attend the

Second International Symposium on Animal and Plant Toxins. He is survived by his wife, a seven-year-old daughter and a six-year-old son.



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Subject Index

## GENERAL



# AGRICULTURAL DEVELOPMENT AND THE DISTRIBUTION OF VENOMOUS SNAKES AND SNAKE BITE IN ISRAEL

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## INTRODUCTION

THIRTY FOUR SPECIES of snakes occur in Israel. Seven of these are venomous, six belonging to the family of the Viperidae and one to the family of the Elapidae (Barash and Hoofien, 1956). Only two venomous species are common. The first is the Palestine viper, *Vipera xanthina palaestinae* Werner, which occurs in the Mediterranean region of Israel, e.g. the northern and central part. The other one is *Echis coloratus* Günther, a desert species. All of the other venomous snakes are also desert forms and relatively rare; the two species of the genus *Cerastes* have only a restricted distribution in Israel (Mendelssohn, 1963).

Information on the frequency of occurrence of the venomous snakes in Israel was obtained by recording the number of specimens brought to the Serpentarium of the Tel-Aviv University from 1958 onwards. There are no professional snake catchers in Israel, but those who bring in snakes are paid for them. There is, however, much interest in aiding in the production of antivenins, since the collectors take into account the possibility that they themselves might be bitten. The payment is, therefore, not the main reason for bringing in rather than killing venomous snakes. Distribution maps were plotted according to the localities where the snakes had been collected. The number of snakes delivered fluctuates from year to year and is affected by several factors, one of them being the amount of advertising. The low numbers of *Vipera xanthina palaestinae* and of *Walterinnesia aegyptia*, for

instance, received in the years 1964–1966, are clearly correlated with discontinued advertising (Figure 1). However, the monthly fluctuations represent quite reliably the snakes' activity throughout the year (Figure 2).

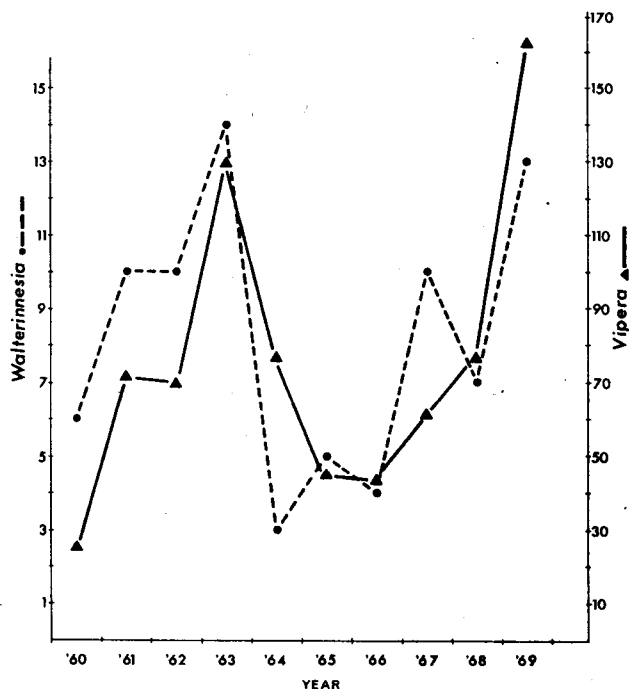


FIGURE 1. Number of specimens of *Vipera xanthina palaestinae* and of *Walterinnesia aegyptia* brought to the Tel-Aviv University Serpenterium during the years 1960–1969

Analysis of the records shows that agricultural development seems to be favorable for some of the venomous snakes, in that certain species are able to establish and maintain relatively dense populations in and around agricultural settlements. Three species are involved, one of them, however, only in a circumscribed area.

#### *VIPERA XANTHINA PALAESTINAE* WERNER

This form is closely related to, or perhaps conspecific with the Turkish *Vipera*



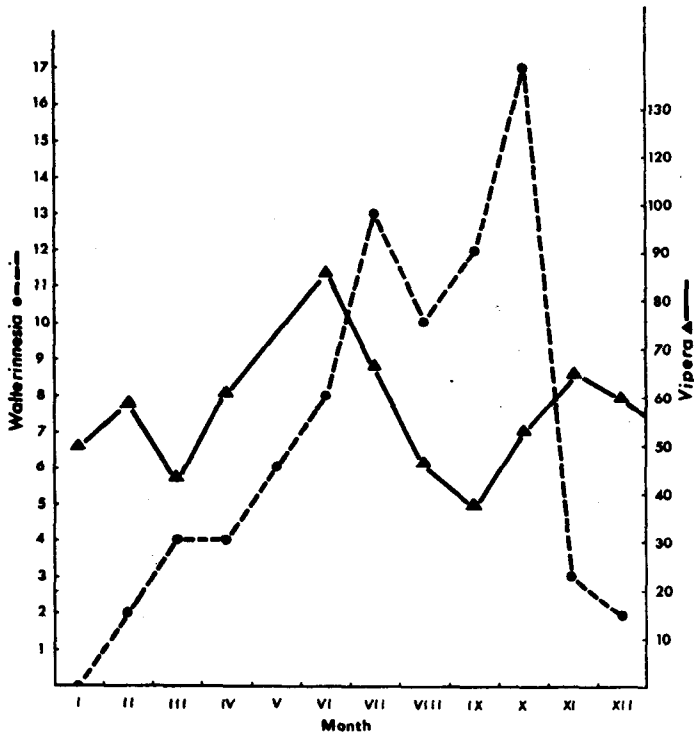


FIGURE 2. Monthly activity of *Vipera xanthina palaestinae* and *Walterinnesia aegyptia* as represented by the number of specimens brought to the Tel-Aviv University Serpentarium during the years 1960–1969

*x. xanthina* (Gray), but is almost endemic to Israel, where its distribution is mainly restricted to the Mediterranean part of the country. It also penetrates, however, into the hot and arid Jordan valley and ranges into the adjoining areas of the neighboring countries. In Israel its distribution coincides more or less with the former distribution of the Mediterranean forest, and its color and pattern is cryptic in relation to the floor of the forest. The Palestine viper is, however, a highly adaptable species and also penetrates into swamps, sand dunes and steppe areas. It is the only common venomous snake in the northern and central part of Israel, except for a restricted area on Mt Gilboa, in which two other species occur as well. Its range is also that most densely settled by humans.