Cobra-Venom Protein Preferentially Cytotoxic to Certain Cell Types Including Yoshida Sarcoma Cells and its Effects on Lipid Constituents of Cell Surface Membrane

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Cobra venom contains a number of proteins having enzymic activity and potent pharmacological effects. After the separation of lethal constituents from the other protein fractions in cobra venom, a protein component showing considerable selectivity in its cytotoxic effects on Yoshida sarcoma cells as compared with erythrocytes, leucocytes, lymphocytes and bone-marrow cells has been purified (Braganca *et al.*, 1967). The cytotoxic protein is free of the lethal factors and phospholipase A. It is homogeneous on rechromatography and on gel electrophoresis. None of the known factors present in cobra venom is involved in the cytotoxic action. Results of a study using fluorescent dansyl-cytotoxin complex demonstrated initial combination of the cytotoxin with surface components of the susceptible cells. Competitive experiments with phospholipids to inhibit cytotoxicity indicated combination of the cytotoxin with the more acidic phospholipid-protein complexes on the cell surface. Much of the specificity shown by the cytotoxin conceivably arises from the distinctive arrangement of lipoproteins and their characteristic orientation on cell membranes of susceptible cell types.

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Metabolism of Ergosterol in the Larva of the Rice Moth (*Corcyra cephalonica* St.)

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Insects are generally incapable of synthesizing sterols and therefore require a dietary source of sterols, apparently for the synthesis of ecdysone (Clark & Bloch, 1959*a,b,c*; Gilbert, 1964). In phytophagous insects this requirement seems to be met by ergosterol or other phytosterols. When larvae of the rice moth (*Corcyra cephalonica* St.) are fed on a diet containing only 'fast-reacting' sterols of the ergosterol type, the tissues of the insect still contain only 'slow-reacting' sterols of the cholesterol type. It is reasonable to conclude that the insects possess an enzyme system for bringing about this change. This has been confirmed by feeding the larvae on ¹⁴C-labelled ergosterol and showing its conversion into a

cholesterol-type sterol. It has been found that homogenates of the larvae are also capable of bringing about this transformation. The conversion with homogenates requires either glucose or ATP and a reduced nicotinamide coenzyme.

Radioactivity from [2-¹⁴C]mevalonate is incorporated by the larvae into the unsaponifiable lipid fractions, including ubiquinone. However, only negligible radioactivity is found in the sterols, indicating that the metabolic block is quite specific.

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Studies on Lipids in Insects (Lepidoptera: Saturniidae)

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Information on the composition of insect lipids and their metabolism is rather scanty and the reported chemical analyses are fragmentary and much at variance. Hence the following studies were carried out on *Philosamia ricini*, an insect of economic importance in the Indian silk industry.

Larval and pupal oils extracted from entire silkworms were fractionated into their major components (free fatty acids, neutral lipids and phospholipids) and their variation was studied throughout development until emergence.

It was observed that total lipids increased throughout larval development and attained maximum concentration at the fifth (last) instar stage. On commencement of spinning there was a significant decrease followed by a sudden increase to a more or less constant value until day 12, when the maximum concentration of lipids occurred. Neutral lipids and free fatty acids followed more or less the same pattern as the total lipids. Phospholipids, which constitute 2-10% of the total lipids, increased with development, but decreased immediately at ecdysis after emergence.

Since fat reserves are mainly located in the fat-body and various tissues exhibit different lipid contents, fat-body lipid variation during development was studied. Total larval fat-body lipids increased threefold during the fourth instar, and concurrent significant decreases in free fatty acids and phospholipids and a twofold increase in neutral lipids were observed.