than its other form given by (7) which has been debated by several workers.

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HISTOLYSIS OF PEDIPALPAL MUSCLE OF THE SCORPION *HETEROMETRUS FULVIPES* (C. KOCH) DURING MOLTING

LITERATURE on arachnid metabolism during molting is scarce. On the other hand ecdysial metabolism in insects and crustacea is extensively worked out. The present communication makes a preliminary report of hitolysis in the pedipalpal chelate muscle of the scorpion, *Heterometrus fulvipes*.

In our collection of the scorpions, we came across a female specimen, clearly in the post-molt condition. The animal was lethargic and the skin was soft and transparent. No attempt was made to stage the animal in the molt cycle as proposed by Drach[1]. The flexor-extensor muscle mass was exposed in the chela of the pedipalp by incision of the exoskeleton. It was granulated and had a more fluid appearance than that of the normal scorpion. This 'liquidized' appearance may be due to increased water content. A similar correlation between increased water content and granulation of muscle has been noted when the muscle atrophies due to deprivation of its innervation in the scorpion[2] and in the vertebrates[3-7]. It may, however, be noted that this comparison between liquidization of muscle during molting and that occurring due to denervation has to be confined only to the limited extent of physical appearance and increase in water content since the causo-mechanisms for these two processes are different: denervation atrophy involves an important deprivation of trophic influence of the nerve on the muscle whereas in liquidization associated with molting no such clear-cut trophic influences can be implicated.

The muscle total weight (holo-histontic weight) obtained by pooling the muscle masses of chelae of both pedipalpi of the scorpion, as also the histosomatic index (HSI, obtained by calculating the weight of chelate muscle per cent total body weight) show important decreases in the molted scorpion, although the decrease in the HSI is not statistically significant (Table I). The decrease of the above

TABLE I

Pedipalpal chela muscle, weight, its histosomatic index and some biochemical parameters in relation to molting in the scorpion Heterometrus fulvipes

Parameter	Normal	Post-molt		d.f.	P	% Change
Muscle weight (mg/g wet)	[a]522 ±49·17 (4)	269 (1)	[b]4·602	3	<0·02	− 48·5
Histosomatic index of muscle (HSI)	82·18 ±3·416 (4)	3·461 (1)	1·245	3	NS	−57·9
Total protein (mg/g wet)	87·757±6·876 (4)	138·28 (1)	6·573	3	<0·01	+57·6
TFFPS (μg/g wet)	12·06 ±2·992 (4)	38·69 (1)	7·961	3	<0·005	+220·8
Total protein (Holohistontic levels, HHL) (mg/tissue)	45·60 ±2·771 (4)	37·20 (1)	2·711	3	NS	−18·4
TFFPS (HHL) (μg/tissue)	6·328±1·733 (4)	10·41 (1)	3·656	3	<0·05	+64·6

a. Values are means ± standard deviations (numbers of estimation).
b. Statistical treatment (according to Pillai and Sinha[11]).
t = Calculated students' *t* test values.
d.f. = Number of degrees of freedom.
P = Level of significance of difference.
NS = Not significant.

parameters are indications of high level of atrophy undergone by the muscle during molting. The total proteins, estimated with Folin-Ciocalteu reagent[8] in the residues of trichloroacetic acid (TCA) homogenates were significantly greater in the 'molted' muscle as compared to the normal muscle. However, the total protein content when expressed in terms of the whole tissue (holo histontic level = total individual tissue level), showed decrease (− 18·4%). The total free Folin-positive substances

(TFFPS, which include free amino acids) estimated in TCA supernatants using Folin-Ciocalteu reagent in conjugation with cobalt reagent[9] showed increases in weight specific as well as holo-histontic levels in the 'molted' muscle. The granular and more fluid consistency of the molted muscle, the decrease of total protein content and increase of TFFPS (which include free amino acids) at the holo-histontic level are reasonable indications of atrophy of the muscle associated with molting.

The tissues predominantly concerned during crustacean ecdysis are blood, hepatopancreas and integument[10]. Nevertheless the muscle also undergoes certain changes. Extensive histolysis of the large chela muscle of *Gecarcinus lateralis* has been reported. This involves considerable loss of muscle protein[12]. The data presented here for *H. fulvipes* muscle involving decrease of total protein at holo-histontic level may be due to such histolytic process.

The degradation of the chela muscle tissue in *G. lateralis* has been suggested to aid in the removal of large muscle mass through narrow basal joint during ecdysis. It could be the same in scorpion.

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A COMPARISON OF THE EFFECT OF CYCLOHEXIMIDE TREATMENT ON THE ANTIVIRAL ACTIVITY OF DIFFERENT TYPES OF INTERFERON INDUCERS IN MICE

INTERFERON induction and antiviral activity of Newcastle disease virus (NDV)[1,2] have already been reported. Tests with 6–MFA, an antiviral agent from *Aspergillus flavus.* DU/KR/162 *b* (now re-identified by Dr. D. I. Fennell, NRRL, Peoria, Illinois, U.S.A. as *Aspergillus ochraceus,* Personal communication) showed that mice treated with 6–MFA produce serum and tissue interferon (unpublished data) and also develop anti-Semliki Forest virus resistance[3-5]. A subculture of the fungus has been deposited with the American Type Culture Collection (ATCC 28706).

Evidence over the past few years has accumulated to show that interferon production stimulated by viral or nonviral inducers can significantly be enhanced by cycloheximide treatment in animals[6] as well as in cultured tissue cells[7-8]. Because of a possible clinical significance of this, we have compared the inducing capacity of antiviral resistance of 6–MFA in mice with that of NDV in the presence of cycloheximide and have noticed important differences.

Thirty-five day old Swiss-CDRI mice of either sex weighing 16–18 g were used in the present experiments. Semliki Forest Viruh (SFV) was procured from the ATCC and passaged intracerebrally (i.c.) in the 35 day old mice. A 10% brain homogenate was prepared in Hanks' balanced salt solution, which formed the stock pool and maintained in aliquots at — 20° C. The strain of neurovaccinia virus was procured from the ATCC and maintained similarly. The LD_{50} titres of both viruses were calculated by the Reed and Muench method[9], on the basis of ten-fold dilutions of inocula.

The egg-adapted vaccine (allantoic fluid) strain of NDV was obtained from the Animal Husbandry Department, Lucknow. 6–MFA was prepared by acetone treatment of the crude filtrate of *A. ochraceus* as described earlier[3]. Cycloheximide was