

of the gut was not always the same. The distal and central parts of the lobes of liver had a larger concentration of glycogen in their hepatic cells than in those at the base of the liver, and the level of concentration was conspicuous in the liver of the well-fed specimens. Thus the nature of localization of the glycogenic substances in the present fish largely agreed with those of *Salmo gairdnerii*⁵ and *Carla catha*³. However, it showed difference from the case of the mosquito fish, *Gambusia affinis*¹, for its having minute, globular and unstained lipidlike substances in between purple-red stained masses of the glycogen in the cells with the result that the aggregation of the glycogen masses was not compact in *O. punctatus*. The difference in the nature of the diet (piscivorous feeding habit of *O. punctatus*) seems to be responsible for this variation.

In an earlier investigation of this fish⁴, a high level of alkaline phosphatase activity was noted in the striated border of the absorptive cells of the anterior portion (including pyloric caeca) of the intestinal tract. This provided an indirect evidence to the possibility of a vigorous phosphorylation activity in the gut-wall, and as such in the high rate of glycogenesis in the liver.

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SUSCEPTIBILITY OF AN INSECTIVOROUS BAT (*RHINOLOPHUS ROUXI*) TO EXPERIMENTAL INFECTION WITH KYASANUR FOREST DISEASE VIRUS

THE involvement of chiroptera in the natural cycle of Kyasanur Forest Disease (KFD) virus was first suspected when neutralizing antibodies against KFD virus was demonstrated in two species of bats, viz., a frugivorous bat, *Rousettus leschenaulti* (Pavri and Singh¹, 1965) and an insectivorous bat, *Rhinolophus rouxi* (VRC, unpublished data). Subsequently, four isolations of KFD virus were made from the spleens of naturally infected *R. rouxi* and one from their argasid tick ectoparasites (Rajagopalan *et al.*², 1969). Our interest was therefore drawn to investigate viraemia

in this species of bat after experimental infection with KFD virus.

While embarking on an experiment of this nature it was felt necessary to maintain these bats alive in captivity. We made several attempts in this regard. At first live and killed meal worms were left in the cages for bats to feed. Since the bats did not accept this feed, a mixture containing meal worms, ripe banana, cheese and white ants mashed into a paste was force fed to bats (Sulkin, personal communication). However, the bats did not accept this feed too. A proportion of bats survived up to 4 days under laboratory conditions. Since the bats were too small to be bled daily we decided to sacrifice them at daily intervals after experimental infection.

Twenty-five bats were inoculated subcutaneously, with 3.6 dex to 8.6 dex of KFD virus (strain isolated from *Haemaphysalis spinigera*). Two to five bats were sacrificed daily subsequent to the inoculation of KFD virus. A serial tenfold dilution of blood in rabbit serum phosphate saline (RSPS) and 10% suspension of organs such as, spleen, kidney, lung, brain and salivary glands, were inoculated intracerebrally into adult swiss mice. Confirmation of KFD virus isolated from blood and organs was made by complement fixation tests.

In the first experiment eight bats received 3.6 dex of KFD virus. The level of virus in blood ranged from traces of virus on first and second post-infection (PI) days to 3.0 to 4.0 dex/0.03 ml on third and fourth days after inoculation. KFD virus was recovered from spleen, lung and brain on 2nd PI days, and spleen, lung, brain, kidney and salivary glands on third and fourth PI days. In the second experiment 17 bats received 8.6 dex of virus. The level of virus in blood ranged from 1.0 dex/0.03 ml to 3.0 dex/0.03 ml on first day to 2.7 dex/0.003 ml to more than 4.7 dex/0.03 ml on fourth PI days. Virus was isolated from spleen on first through fourth PI days.

This preliminary experiment has shown that KFD virus circulates in the blood of *R. rouxi* after experimental infection. Since the bats did not feed on the diet provided by us, they were apparently under physiological stress during the study. The dosage of virus given in one experiment was considerably high and it may be argued that viraemia recorded may not imply a replication of virus. However, in the first experiment where 3.6 dex of virus was used there was a gradual increase in the titre of virus in blood from first through fourth PI days. This would suggest that KFD virus circulates in the blood of *R. rouxi* possibly after replication.

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CORRELATION BETWEEN CYTOCHROME C AND MYOGLOBIN CONTENTS OF THE DIFFERENT LEG MUSCLES AND M. PECTORALIS WITH REFERENCE TO SEX OF THE DOMESTIC FOWL

FACTORS affecting the percentage of myoglobin in muscle¹ had confirmed that a high concentration of this pigment is usually found in muscles of high physiological activity. This is of particular interest in view of the strong affinity of myoglobin for oxygen which enables it to act as an intramuscular oxygen store for the tissue's principle oxidizing catalysts, the cytochromes²⁻³. Cytochromes are heme proteins in which iron forms the core of the heme and it is the iron that is oxidized and reduced in electron transport. Keilin⁴ as early as 1925 had pointed out that all aerobic cells contain cytochromes (as determined spectroscopically) and is highest in the most actively respiring cells. However, the concentrations of cytochromes has been reported both as being higher or lower in myoglobin rich or 'red' muscles than in the 'white' variety.

In the course of our investigation on the myoglobin content of certain muscles of the domestic fowl, it has been noted that certain muscles involved in walking are rich in myoglobin, fat and lipase and others contain less of these; also that these substances are less in the M. pectoralis of the fowl⁶. It was therefore thought advisable to find out if there is any correlation between myoglobin content and that of cytochrome C content in the leg muscles and breast muscles of the male and female domestic fowl.

The birds used were (18 months old male and female) those of Karnatak University breed. The bird was killed by decapitation and the leg as well as breast muscles were removed immediately and stored at 0°C until used. The myoglobin concentration of different muscle preparations was estimated as described elsewhere⁷. The cytochrome C content of the different leg as well as breast muscle was extracted and estimated according to the procedure described by Potter and Dubois⁸.

The cytochromes are the natural hydrogen acceptors of the dehydrogenase system in the cell. The best known member of the cytochrome system is cytochrome C, the soluble cytochrome. Myoglobin is involved in the hydrogenation process and as such one can expect a correlation between the myoglobin and cytochrome C content in a muscle; if more of these two components occur, such a muscle is expected to be more active than others. The results given in Table I show that M. gastrocnemius pars externa and

TABLE I
Correlation between cytochrome C and Myoglobin contents of the different leg muscles and M. pectoralis with reference to sex of the domestic fowl

Muscle	microgram/gm wet wt.			
	Cytochrome C		Myoglobin	
	Male	Female	Male	Female
Sartorius	22	53*	1070	2806
Biceps femoris	14	13	1830	1742
Semitendinosus	25	22	3250	1223
Tibialis anterior	16	14	1290	1196
Gastrocnemius pars externa	70	31	4530	2657
Pectoralis	6.5	6.0	44	35

* The results are averages of three determinations in each case.

Myoglobin values are used for comparison purpose (unpublished results).

semitendinosus in the male domestic fowl show more of myoglobin and cytochrome C content than other leg muscles. In the female M. sartorius shows more of these substances than the two muscles M. gastrocnemius and semitendinosus as well as other muscles. Though this is a sexual difference, the explanation for this has to be sought in the stress to which M. sartorius is subjected to in the female as a result of development of ovary and oviduct. In the ultimate analysis the differences between the muscles in cytochrome C and myoglobin content can be attributed to their specific individualities on the one hand, and the use or strain to which they are subjected to on the other hand; this use in males may be due to higher exercise.

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