of neutrophils to digest phagocytosed microbes and increased the coagubility of blood indicating thrombiotic and haemorrhagic complications in the poisoned animals[8]. It is apparent from Table I that the per cent reduction of RBC, PCV and Hb values in Sumithion and Sevin treated fish did not exhibit any appreciable difference between them. The decrease of RBC, PCV and Hb values, results in 'hypochromic microcytic anemia' which was attributed to deficiency of iron and its decreased utilisation for 'Hb' synthesis[9]. It is well known that glycolysis is concerned with the reduction of methemoglobin as soon as it is formed, thus maintaining the iron of the 'Hb' in the ferrous form in which state only, it acts as an efficient oxygen carrier. The increased activity of LDH, decreased cellular oxidations[1] and cellular respiration[2] in Sumithion and Sevin exposed fish indicate the prevailing of anaerobic segment of glycolysis. The disruption of iron synthesising machinery due to inhibition of aerobic glycolysis could be the reason for the decrease of blood values in the stressed fish.

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Department of Zoology, S.V. University College, Tirupati, *February* 9, 1979.

P. Ranganatha Koundinya.
R. Rama Murthi.

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EFFECT OF BRAIN AND CORPORA ALLATA EXTRACTS ON THE LIPID PROFILE OF THE HAEMOLYMPH OF *ACHAEA JANATA* L.

The lipid profile of insect haemolymph varies with the physiological state of the animal and reflects the role of this tissue as a medium for the transportation of materials from sites of absorption or synthesis to sites of utilization or storage. That corpora allata, control certain aspects of lipid metabolism in the various tissues of insects is now very well understood. Allatectomy increases the total lipid content and also stimulates turn-over of phospholipids and triglyceride fractions[1]. In the allatectomised *Schistocerca gregaria* Walker and Bailey[2] have demonstrated considerable increase in triglyceride content of the fat body but no appreciable effect on the haemolymph lipid level. The role of cerebral neurosecretory material on carbohydrate as well as on the lipid metabolism in the fat body of some insects has also been suggested[3,4]. While working with *Cecropia* moth Gilbert and his associates[5] have shown that corpora allata stimulate incorporation of (1-C^{14}) palmitate into ovarian glycerides. It is well understood now that glycerides provide some of the energy for embryogenesis. *In vitro* studies on the female *Lucophaea maderae*[6] have suggested that the corpora allata act on both the fat body and ovary by making more lipid available for storage in the maturing oocytes. It is apparent from the aforementioned observations that the corpora allata appear to control lipid metabolism.

Adult female moth *Achaea janata* L., the larvae of which are serious pest on castor plant, has a very well developed corpora allata. It is believed that the glycerides from the fat body are being released into the haemolymph, which are then transported to the developing oocytes. The experiments outlined below are meant to ascertain the influence of the extracts of corpora allata and brain, on the lipid release from the fat body of the moth *Achaea janata* L.

The adult female moths used in the present experiments were collected from the laboratory culture. The procedure for the collection of haemolymph and the fat body was essentially similar to that described elsewhere[6]. The corpora allata and brain were removed carefully from several individuals, pooled and homogenized at 3–4° C in a known volume of distilled water. The homogenates were used as such to test their influence on the lipid release. The fat body as well as the haemolymph pooled from various individuals were used for each set of experiment. The incubation mixture in the Erlenmayer flask (10 ml capacity) consisted of the fat body (100 mg), 0·5 ml freshly collected haemolymph and 0·2 ml corpora allata extract (CAE) or brain extract (BE). The incubation was carried at 26° C for 90 min with constant shaking. The incubation mixture without CAE or BE in the incubation mixture served as control. Extraction of lipids from the incubation medium and its separation into monoglyceride (MGL), 1,2-diglyceride (1,2-DGL), 1,3-diglyceride (1,3-DGL), triglyceride (TGL) and free fatty acids (FFA) as well as their estimation was essentially similar to that described elsewhere[7].

The results obtained on the various glycerides and FFA levels of the haemolymph are summarised in Table I.

The medial neurosecretory cells of the brain in three species of mosquitoes is implicated in the regulation

TABLE I

Influence of brain and corpora allata extracts on the release of lipids from the fat body Achaea janata L.

Individual glycerides	Microgram glycerides (as glycerol or palmitic acid equivalent) or fatty acids/ml Haemolymph		
	Control	Brain extract	Corpora allata extract
Mono-glyceride[7]	26·0±4·0	23·6±3·9	24·0±6·8
1,2-Diglyce-ride[7]	32·0±2·3	59·0±6·0 (P 0·005)	34·0±5·3
1,3-Diglyce-ride[7]	29·6±3·7	52·0±2·9 (P 0·005)	27·0±6·0
Triglyceride[7]	16·3±0·25	16·0±3·0	15·3±2·1
Free fatty acids[7]	36·7±7·0	43·0±6·8	39·0±6·0
Total neutral lipid and free fatty acid content	139·9	193·6	139·8

of aspects of lipid synthesis[3]. Isolated fat body of the *Cecropia* moth when assayed after the addition of corpora allata indicated decrease in the rate of lipid biosynthesis[5]. On the other hand it has been shown that an aqueous extract of corpora cardiaca produced a significant increase in DGL content of the haemolymph and augmented the lipid mobilization from the fat body[7]. In the desert locust neither extirpation nor implantation of corpora allata brought changes in the concentration of DGL content of the haemolymph[8]. It is believed now that the active agent in lipid metabolism is brain neurosecretary material which is stored and released by the corpora cardiaca[9]. In the present experiment it may be seen that both 1,2 and 1,3 DGL content of the haemolymph increased significantly with BE. The increase in FFA level with BE was insignificant. CAE has no appreciable influence on either glycerides or FFA levels of the haemolymph. The primary source of haemolymph DGL is the TGL store, contained within the fat body. The release of DGL from the fat body requires the hydrolysis of TGL and lipolytic activity has been reported in the fat body of several species of insects. It appears from these observations that the corpora allata in *A. janata* do not influence lipid mobilization from the fat body into the haemolymph. The significant increase in the 1,2 and 1,3 DGL level of the haemolymph containing BE supports the hypothesis that the neurosecretory material of the brain stimulates TGL (which constitutes 86% of the total neutral lipid) hydrolysis in the fat body, resulting in the release of DGL and FFA into the haemolymph.

Department of Zoology, Karnatak University, Dharwar 580 003, *April* 14, 1979.

V. L. KALLAPUR.
S. N. HOLIHOSUR.*

* Department of Zoology, Agricultural College, Dharwar 580 005.

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BLOOD 2-3 DIPHOSPHOGLYCERATE (DPG) AND POTASSIUM HOMEOSTASIS IN THYROID DISORDERS*

IT has been well documented that hyperfunction of thyroid gland leads to increased sodium content of red blood cells,[1–5] while conflicting observations have been reported on red cell potassium homeostasis in hyperthyroid state[6–7]. Since 2–3 Diphosphoglycerate (DPG) in blood regulates potassium homeostasis[8], it was proposed to examine the effect of thyroid hormone on blood DPG and potassium homeostasis in laboratory rats.

Materials and Methods

Adult male Sprague-Dawley rats were used in the investigation, Hypothyroidism was induced by single intraperitoneal injection of 1 mCi ^{131}I in each rat. Hyperthyroidism was developed by daily i.p. injection of 90μg L-thyroxine to each rat for 14 days. Thyroid status was evaluated by serum concentration of protein bound iodine and growth rate of experimental rats. Potassium in plasma and red blood cell was estimated colorimetrically[9]. Influx of potassium in erythrocytes *in vitro*, using Rubidium-86 as the marker, was studied as per recommendations[10], using Nuclear Chicago Autogamma Spectrometer Model 4219. Blood DPG was estimated colorimetrically[11]. Reduced glutathione (GSH) content of blood was studied by colorimetric procedure[12].