Discussion. Physiological and biochemical changes in the uterine tissue are governed by the ovarian hormones, estrogen and progesterone[10], which are in turn regulated by pituitary gonadotrophins and hypothalamic-releasing factors[11]. Progesterone, an active antiestrogen, has been reported to reduce the uterine glycogen in rats[12,13]. On the contrary, it elevates the glycogen contents in the uterus of Macaque[14]. However, it does not alter the glycogen level in the uterus of rat[15-17]. In the present investigation, both 50% ethanolic and benzene extracts of *H. rosa-sinensis* Linn. reduce the uterine glycogen contents significantly (table). Moreover, the inhibition in glycogen level increases as the dose is increased which further confirms its dose-response relation. The inhibition in the glycogen contents in the uterus of rat under the influence of these plant extracts is due to their antiestrogenic activity[8] which may be further accounted for its inhibition in motor activity of the uterus. However, the antifertility activity of these plant extracts, due to change in uterine contractility, is yet to be elucidated.

1 This investigation was supported by a grant from Council of Scientific & Industrial Research, New Delhi.

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Cerebral neurosecretions and regulation of moulting in a haematophagous insect *Panstrongylus megistus,* (Heteroptera, Reduviidae)[1]

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Summary. 2 factors elaborated by distinct neurosecretory cells in the pars intercerebralis control moulting in *Panstrongylus megistus.* The 1st, originating probably in the A′ cells, activates the thoracic gland. The 2nd, produced by the A cells, acts at an earlier stage in a different way.

It is generally accepted that moulting in insects is controlled by the activity of the thoracic glands (moulting glands), which are themselves activated by neurosecretory cells in the pars intercerebralis.

During an investigation of the regulation of the initial phases in oogenesis[2,3], involving different surgical manipulations, we have observed that the mechanism of control seems more complex in the heteropteran *Panstrongylus megistus.* A previous investigation of the varying levels of ecdysones in the haemolymph[4] demonstrated that 2 peaks occur during the 5th larval instar. The ecdysone level peaks at 240 ng/ml on the 8th day after the blood meal (dABM), beginning to decline on the 10th dABM (164 ng/ml). The 2nd peak is considerably larger, reaching a maximum level on the 15th dABM (7000 ng/ml) (figure 1,A).

Materials and methods. The insects used in this investigation were female *P. megistus* larvae in the 5th instar. They were raised in the dark at a temperature of 27±1 °C and a relative humidity of 70±5%. They were fed once, on guinea-pigs, 10 days after moulting. The techniques of electrocoagulation surgery of the pars intercerebralis (PI) have been described previously[2]. A cells were ablated specifically using tweezers. Ablation of the thoracic glands was performed by pulling out the lobe of the fat body where they are joined together. Ecdysterone was injected into the abdomen as a 10-µg/µl solution in oil.

Results. Ablation of the thoracic gland on the 7th and 9th dABM. Ablation of the thoracic gland was carried out either on the 7th or on the 9th day after the blood meal. The 1st operation suppressed moulting while the 2nd did not in 10 of the 13 larvae operated (figure 1,B). The critical time for the action of the thoracic gland therefore appears

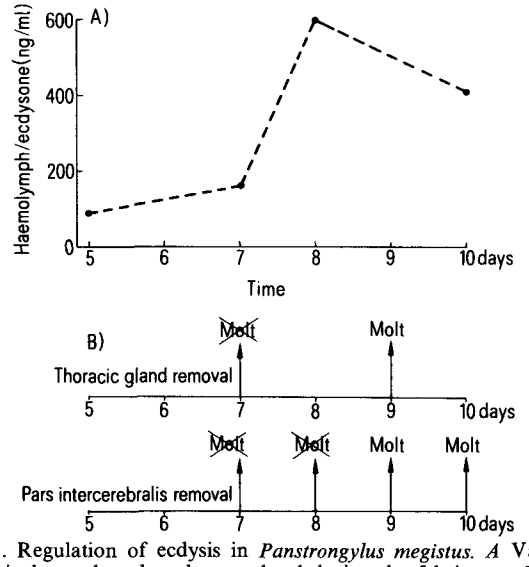

Fig. 1. Regulation of ecdysis in *Panstrongylus megistus. A* Variations in haemolymph ecdysones level during the 5th instar; *B* effects on moulting as a result of ablating of the thoracic gland or the pars intercerebralis at different times.

to be between the 7th and 9th days, which correlates well with the time at which the 1st ecdysone peak is observed in the haemolymph. These observations suggest that, in *P. megistus,* as in other insects[3,5,6], the 2nd ecdysone peak is not involved in the moulting process.

Cauterisation of the PI on the 7th, 8th, 9th or 10th dABM. Destruction of the PI was carried out on the 7th, 8th, 9th or 10th dABM. While moulting occurred in larvae operated on the 9th and 10th days, it was suppressed when the operation was performed on the 7th or even on the 8th dABM (figure 1,B). The critical time at which neurosecretory activity is required is therefore very close to that at which thoracic gland activity is necessary.

Specific ablation of the A cells in the PI on the 7th dABM. The PI of *P. megistus* contains at least 4 neurosecretory cells types[7]. The best characterized are the A cells, which were first described in *Rhodnius prolixus* in 1938[8]. Selective ablation of A cells was carried out on the 7th dABM, when complete ablation of the PI suppresses moulting. This operation did not suppress the moult, which indicates that the A cells are not involved in the secretion of the factor which activates the thoracic gland.

Specific ablation of the A cells in the PI at 24 h ABM. Ablation of the A cells 24 h after the blood meal however, did suppress moulting, indicating that the activity of these neurosecretory cells is also essential for the process to occur, but is required only at very early times.

Cauterisation of the PI followed by ecdysterone injection. We have previously found that cauterisation of the PI carried out on the 7th dABM inhibits moulting. When cauterisation is performed earlier (48 h ABM), it has the same effect. In the 1st case, ecdysterone injection relieves this inhibition, but when the operation is carried out at earlier times no such relief is observed. This indicates that the A cells do not act through the thoracic gland.

The neurosecretory cells which secrete the thoracic gland activating factor (brain hormone) remains to be identified. A histophysiological examination of A and A′ cells from 5th instar larvae suggests that the A′ cells, which release their neurosecretory material later than A cells, may be responsible[7].

Conclusion. Experiments on *P. megistus* show that 2 separate factors, both produced in the PI, are required for moulting to occur. 1 is probably secreted by the A′ cells cells and, as suggested in the classical model, activates the thoracic gland. The other is secreted by the A cells, and acts at an early stage in the process, probably directly. It may act to induce mitoses preceding apolysis, as indicated by investigations of the regulation of the initial stages of oogenesis[2] (figure 2).

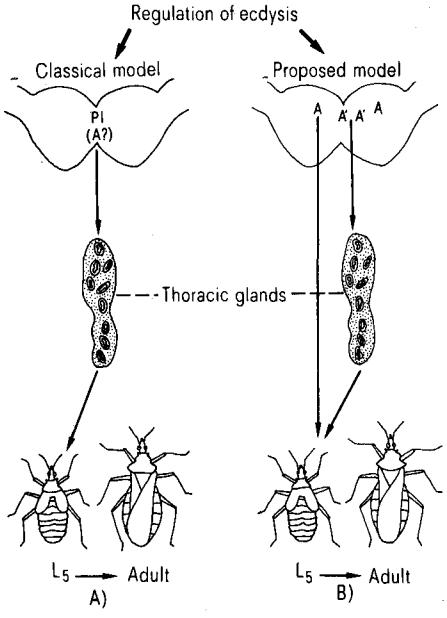

Fig. 2. Regulation of ecdysis. *A* Classical model; *B* proposed model. L_5: 5th stage larva.

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Effective dose present in cockroach larvae exposed continuously to a juvenile hormone active insect growth regulator[1]

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Summary. Larvae of the German cockroach exposed to filter paper impregnated with juvenile hormone (JH) active substance contain, at the middle of the last instar, about one-hundredth of the dose applied to 1 cm^2. The amount of metabolized substance rises sharply before and disappears rapidly after the ecdysis into the supernumerary instar.

Insect growth regulators (IGRs) are slow-acting insecticides, which must be present at a certain concentration in the insect body during a sensitive period in order to affect the insect development. A single application (topical or by injection) requires an initial overdose to cope with subsequent inactivation and discharge of the applied substance. Our experiments are based on application of the substance to a substrate which is ingested or stays in permanent contact with the insects. This arrangement assures a long-term treatment. This paper deals with the question of the actual amount of IGR taken up by these insects.

Material and methods. 10 freshly emerged larvae of the last instar of the German cockroach *(Blattella germanica* L.*)* were confined to 180 cm^3 plastic cups, supplied with food and drinking water and incubated at 24 °C, with 60% relative humidity and permanent illumination. 2 folded filter paper discs (Schleicher & Schüll No. 16, 20 cm^2 each) were added. Tritium-labelled JH-active IGR 2,3-^{3}H 6,7-