

The Stimulation of Oogenesis in *Pieris brassicae* by the Juvenile Hormone Derivative Farnesenic Acid Ethyl Ester¹

Ito² after observing secretory activity of the corpora allata (CA) during oogenesis in the pupal stage of *Bombyx mori* suggested that the CA may have an endocrine function related with oogenesis. However, although Ito's observations were confirmed by authors working with other lepidopterous species³⁻⁵, the necessity of the CA for oogenesis in Lepidoptera could not be verified experimentally for a long time⁵⁻¹⁰. The reason for this failure was that only Lepidoptera with premetabolic egg maturation¹¹ had been used for the experiments. The situation changed, however, when species with postmetabolic oogenesis were investigated¹²⁻¹⁵. One of the species in which the necessity of the CA for oogenesis was clearly demonstrated is the large cabbage white *Pieris brassicae*^{14,15}.

Meanwhile it has been demonstrated in several insect orders that the gonadotropic effect of the CA is produced by the release of juvenile hormone. For Lepidoptera this has not been proved so far. The experiments reported below were made in order to obtain information on this point.

Freshly eclosed virgin females of *P. brassicae* were fed with water only and decapitated on the same day or up to 2 days later. They were then kept in moist chambers, where the insects could survive easily for at least 10 days. If the decapitated females were not further treated, they rarely

produced any mature eggs (Table). However, if such females were treated topically with different concentrations of acetone solutions of farnesenic acid ethyl ester (FAEE), practically all of them matured some eggs (Table). Only 3 exceptions were found in an experiment in which the treatment was delayed up to the 7th day after eclosion.

These simple experiments prove that egg maturation in *P. brassicae* can be stimulated by FAEE in the absence of the CA. The results also suggest that high concentrations of FAEE are less favorable than lower concentrations and that early treatment is better than late treatment, though the number of individuals tested is too small to draw definitive conclusions.

Since in these experiments FAEE was substituted for the juvenile hormone, the results cannot prove, but they strongly suggest, that the CA stimulate oogenesis in *P. brassicae* by releasing juvenile hormone.

Zusammenfassung. Das synthetische Juvenilhormon-derivat Farnesensäureäthylester stimuliert die Eireifung in decapitierten virginen Weibchen von *Pieris brassicae*. Da die Eireifung dieser Art normalerweise durch aktive Corpora allata stimuliert wird, darf angenommen werden, dass der gonadotrope Effekt der Corpora allata auch in Lepidopteren auf der Produktion von Juvenilhormon beruht.

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Egg maturation in virgin females of *P. brassicae* decapitated (D) at 0 to 2 days after eclosion, treated topically with 1 µl of an acetone solution of farnesenic acid ethyl ester (FAEE) of indicated concentration at day (d) after eclosion, and sacrificed (S) at indicated day after eclosion

D	FAEE		S	Females tested	Females producing eggs	Mature eggs per female	
	d	Concentration (%)				Mean	Extremes
0	—	—	8	8	1	2.2	0-18
1	—	—	5	10	2	4.9	0-36
2	—	—	5	7	1	5.6	0-39
2	—	—	7	7	0	—	—
2	—	—	9	3	0	—	—
0	5	5	9	5	5	124.0	64-154
0	5	5	11	5	5	186.0	78-265
1	1	5	5	5	5	142.2	88-245
2	2	10	5	5	5	99.6	57-132
2	2	100	5	5	5	57.6	24-75
2	7	10	10	8	5	23.6	0-56

¹ Product of Hoffmann-La Roche Ltd., Basle. Thanks are expressed for supplying the author with a sample of this substance.

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Labelling of Steroids in Axillary Sweat After Administration of ³H- Δ^5 -Pregnenolone and ¹⁴C-Progesterone to a Healthy Man

It has been suggested^{1,2} that certain apocrine sweat glands may play an important role in the secretion of substances that act as pheromones. Some of these pheromones may be steroids that are sufficiently volatile to be odorous³. In humans, apocrine glands are particularly concentrated in the axillae⁴, and dehydroepiandrosterone (DHA) and androsterone sulphates have been found in considerable amounts in armpit sweat⁵: 17-oxosteroids and other steroids are however also secreted from other

parts of the body surface where apocrine glands are relatively sparse⁶⁻⁸. The actual rate of secretion of steroids by apocrine glands in isolation is of course unknown, but it is known that the growth and function of apocrine glands are under the influence of sex hormones⁴, as are the sebaceous glands⁹.

While studying the in vivo origin of the odorous Δ^{16} -C₁₉ steroids in human urine¹⁰, the opportunity was taken to collect sweat, not only from the general body