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FLESH FLY LARVAE AS AN INDICATOR OF HYPOPHYSEAL EFFECTS

T. L. PATTERSON

The alleged influence on the growth and rate of development from feeding pituitary gland substance has been principally studied on vertebrates, and for this reason, it seemed desirable to determine how some of the invertebrates would react to this gland substance, in whose body no organ comparable to an endocrine gland has been demonstrated.

Flesh flies were used in the investigation and the majority of the experiments were carried out on a larviparous fly of a *Sarcophaga species*, probably *saracena*. These flies may be easily caught on the window ledge of any laboratory during the summer months. They are grayish in color and can usually be distinguished by the checkerboard pattern of gray and black squares on the abdomen. They were paired and placed in separate cages

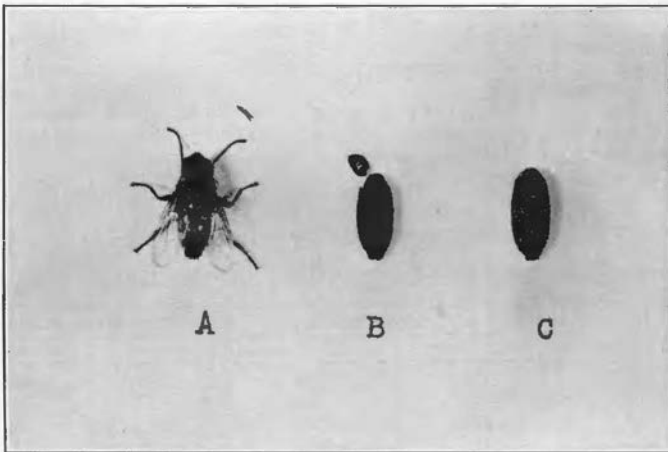


Fig. 1. A, adult *Sarcophaga* fly. Note checkerboard appearance of abdomen. B, puparium from which fly has emerged. C, intact puparium

for rearing young. First stage larvae were obtained shortly after death of the female fly by cesarean section for these larvae or maggots will feed on the tissues of the mother fly in case putrid material is unavailable for larviposition. The larvae so obtained

were equally distributed on slightly decomposing pituitary substance consisting of anterior lobe, posterior lobe and whole gland and control substances consisting of brain and muscle, all tissues being obtained from the hog.

These five respective substances were contained in glass tubes of about two and a half grams capacity to prevent drying. In approximately five days the larval history was completed and the animals had passed into the pupal stage in which condition they could be weighed and measured. A species of *Calliphora*, prob-

EXPERIMENT III

WEIGHT OF PREPUPAL LARVAE AND PUPARIA IN GRAMS—SARCOPHAGA SPECIES

PITUITARY GLAND SUBSTANCE FED			CONTROL SUBSTANCE FED		
ANT. LOBE	POST. LOBE	WHOLE GLAND	BRAIN	MUSCLE	
Prepupal larvae	.221	.103	.185	.190	.116
	.259	.105	.189	.201	.031
	.240	.102	.205	.223	.116
	.250	.103	.155	.223	.086
	.250				.111
Puparia	.180	.162	.185	.150	.162
	.193	.162	.165	.168	.124
	.178	.155	.190	.165	.166
	.155	.164	.165	.135	.156
	.185				.173

Period of Copulation *2 hrs. 45 min.* Date 7/5/24
 First Stage Larvae by Cesarotomy *22* Date 7/16/24
 Rate of *Metamorphosis*:
 Lgth. of larval stage: Ant. Lobe Post. Lobe W. Gland Brain Muscle
120 hrs. 140 hrs. 140 hrs. 120 hrs. 160 hrs.
 Lgth. of pupal stage: *Approximately 11 days for each.*
 Lgth. of adult stage: *14-19 28-31 22-25 27- 10-21 days.*

EXPERIMENT VIII

WEIGHT OF PUPARIA IN GRAMS—SARCOPHAGA SPECIES

PITUITARY GLAND SUBSTANCE FED			CONTROL SUBSTANCE FED	
ANT. LOBE	POST. LOBE	WHOLE GLAND	BRAIN	MUSCLE
.176	.158	.176	.150	.162
.174	.160	.183	.157	.157
.177	.171	.173	.168	.158
.165	.165	.196	.165	.148
.176	.159	.174	.165	.143
			.158	

Period of Copulation *not observed* Date
 First Stage Larvae by Cesarotomy *28* Date 7/17/24
 Rate of *Metamorphosis*:
 Lgth. of larval stage: Ant. Lobe Post. Lobe W. Gland Brain Muscle
130 hrs. 130 hrs. 130 hrs. 130 hrs. 160 hrs.
 Lgth. of pupal stage: *Approximately 11 days for each.*
 Lgth. of adult stage: *27-33 27-31 19-33 24-25 10-25 days.*

EXPERIMENT XIX

WEIGHT OF PUPARIA IN GRAMS — SARCOPHAGA SPECIES

PITUITARY GLAND SUBSTANCE FED			CONTROL SUBSTANCE FED	
ANT. LOBE	POST. LOBE	WHOLE GLAND	BRAIN	MUSCLE
.081	.071	.046	.174	.063
.085	.075	.044	.161	
.078	.070	.037	.082	
.081	.073	.035	.087	
.074	.064	.034	.090	
.078	.051	.018	.084	
.070			.085	
.071			.085	
.025			.081	
			.085	
			.082	
			.082	
			.083	
			.082	

Period of Copulation *not observed*

Date

First Stage Larvae by Cesarectomy 50

Date 8/7/24

Rate of Metamorphosis:

Lgth. of larval stage: Ant. Lobe Post. Lobe W. Gland Brain Muscle
120 hrs. 120 hrs. 120 hrs. 120 hrs. 145 hrs.Lgth. of pupal stage: *Approximately 13 days for each.*

Lgth. of adult stage: 15-33 28-42 12-23 12-33 23-33 days.

EXPERIMENT XXVI

WEIGHT OF PREPUPAL LARVAE IN GRAMS — CALLIPHORA SPECIES

PITUITARY GLAND SUBSTANCE FED			CONTROL SUBSTANCE FED	
ANT. LOBE	POST. LOBE	WHOLE GLAND	BRAIN	MUSCLE
.052	.033	.044	.041	.043
.045	.055	.046	.039	.045
.043	.035	.038	.051	.041
.047	.051	.040	.040	.054
.041	.046	.048	.043	.050
.042	.047	.048	.043	.054
.042	.048	.038	.041	.051
.050	.046	.043	.039	.047
.046	.045	.053	.047	.044
.043	.037	.046	.047	.051
.042	.050	.040	.041	.053
.049	.033	.047		.051
.040		.043		
.045		.043		
.043		.047		
.045		.041		
		.041		
		.051		
		.037		

ably *erythrocephala*, an oviparous fly was used in a few of the experiments.

The results of these experiments indicate that there is no growth producing substance present in the pituitary, not even in the anterior lobe when fed under the conditions described to flesh

flies, since it causes no increase in growth or in the rate of metamorphosis over that of the controls. The slight variations occurring in the gland-fed as well as in the control-fed larvae are more or less uniform in both cases and may be assumed to fall within the limit of experimental error or to variations in the rate of the decomposition of the respective tissue substance fed.

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