

## ENTOMOLOGY

## Relationship between Larval and Pupal Periods of some Lepidopterous Insects

EXPERIMENTS have been carried out in the United Kingdom and the United Arab Republic (Egypt) to show the effect of population density on the silver Y moth, *Plusia gamma* L. and the cotton leaf worm, *Prodenia litura* (Fab.) respectively. In these experiments two parallel cultures of solitary and crowded conditions were maintained for each species.

When discussing the results obtained, an interesting phenomenon attracted our attention. That is, a negative relationship exists between the larval and pupal periods of each species irrespective of sex and culture. In other words, the longer the larval period, the shorter the pupal period and *vice versa*. This phenomenon occurred in both solitary and crowded cultures as shown in Fig. 1. Results also showed that the larval period was longer in the solitary culture than in the crowded culture, while the opposite occurred in the

differences between solitary and crowded conditions for larval and pupal periods were significant.

It has been found that crowding accelerated pupation by the shortening of larval period of some Lepidoptera<sup>1</sup> and this was probably due to competition in the crowded culture. Accordingly, it may be suggested that the longer pupal period in the crowded condition and the shorter period in the solitary treatment might be a result of the negative relationship between the larval and pupal period. However, explanation of the nature of this negative relationship implies the need for further physiological investigations of both larvae and pupae of each culture.

M. A. ZAHER

Department of Plant Protection,  
University of Cairo.

MOUFIED A. MOUSSA

Cotton Insects Investigations,  
Department of Crop Protection,  
Ministry of Agriculture.

<sup>1</sup>Hirata, S., Researches on Population Ecology, III (Entomological Laboratory Kyoto University, Japan, 1956). Long, D. B., *Trans. Roy. Ent. Soc.*, **104**, (Part 15), 541 (1953). Zaher, M. A., and Long, D. B., (in the press).

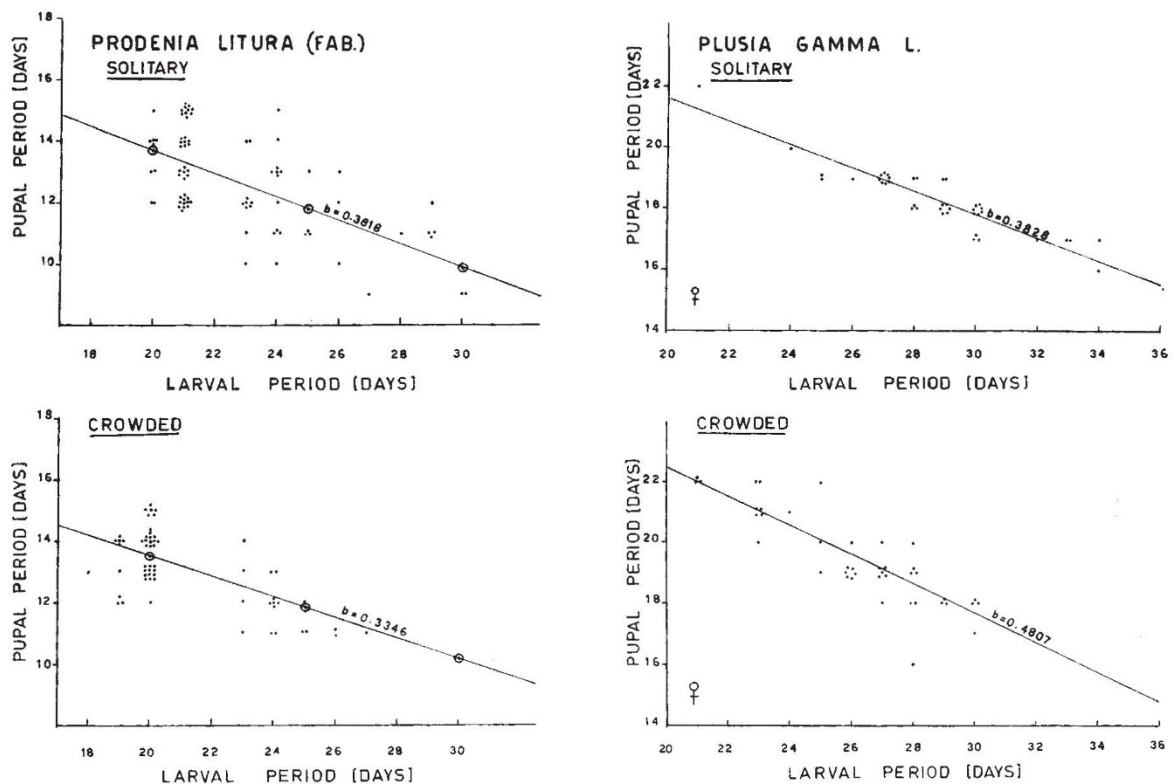


Fig. 1.

pupal period as the solitary ones had the shorter period (Table 1). Statistical analysis showed that the

Table 1.

Species	Larval period (days)		Pupal period (days)	
	Solitary	Crowded	Solitary	Crowded
<i>Plusia gamma</i> (female)	28.8	26.2	18.3	19.5
(male)	29.0	27.2	18.8	19.5
<i>Prodenia litura</i> ..	23.3	22.4	12.7	13.1

## Possible Role of Glycerol in the Winter-Hardiness of Insects

DURING investigations into the carbohydrases of insects<sup>1</sup> in the winter of 1957-58 it was found that the macerated tissue of the dormant larvae of the wood-boring insect of the species *Melandrya striata*, found in felled wood of *Salix amygdaloides* Anderss., contained a considerable proportion of glycerol as revealed by paper chromatography. This preliminary obser-