Marengo, N.P. C.W. Post College of Long Island University, Greenvale, New York USNA. Ether-induced failure of the prepupal muscles to shorten the pupal cuticle of D.melanogaster.

Fraenkel & Rudall (1940) have ascribed the shortening of the puparium of Sarcophaga to two principle agents: (1) muscular contractions of the persistent larval muscles and (2) the changing of the orientation of the chitin crystallites from a random arrangement in the unshortened larval cuticle to an arrangement parallel to the transverse axis of the cuticle. They state that this change in orientation explains the degree of contraction in length shown by the cuticle.

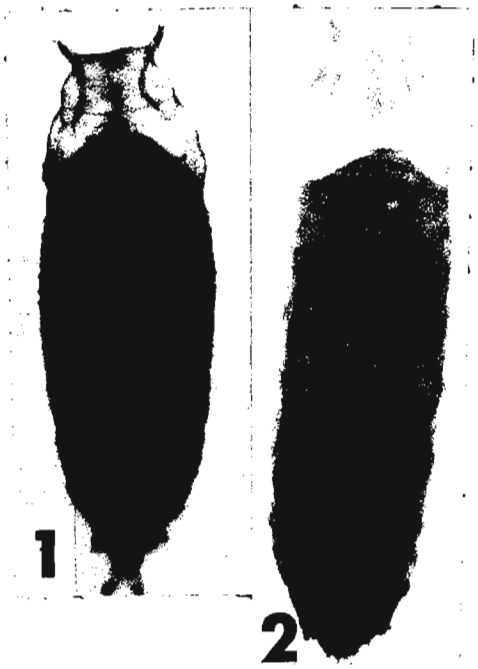

Fig. 1. Control pupa showing normal puparial contour and pupal imago within. X31.

Fig. 2. Pupa which had been etherized during the shortening process. Note normal pupal imago within elongated puparium. X31.

Since Drosophila melanogaster has essentially the same stages in metamorphosis as Sarcophaga (Robertson 1936), this study was devised to establish in D.melanogaster, whether shortening could be prevented by muscular contractions during the shortening process. The results were cleancut and striking, and an account follows.

Wild type Oregon R D.melanogaster were raised on tomato-paste agar at 25°C. When 3rd instar larvae crawled to bottle sides and began movements recognized as just preceding pupation, they were isolated and in petrie dishes and were exposed to ethyl ether for several minutes until the puparium showed signs of hardening. At this time the ether was removed, and the normal process of pupation followed, with the normal-appearing pupa clearly visible within an abnormally elongated puparium (Fig. 2). The control pupa (Fig. 1) pupated normally in the absence of ether. Apparently the anesthetic had no effect on the biochemical changes in the cuticle accompanying the hardening of the puparium, for normal pupation occurred even in the elongated puparium (Fig. 2). Apparently, the removal of the one of the agents described by Fraenkel & Rudall, namely the muscular contractions was enough to prevent normal shortening.

Whether the crystallites of the elongated puparium are arranged parallel to the transverse axis of the puparium can only be determined by X-ray diffraction as used by Fraenkel & Rudall.

References: Fraenkel, G. & K.M.Rudall 1940, Proc. Roy.Soc. B 129:1-34; Robertson, C.W. 1936, J.Morph. 59:351-359.

Mather, W.B. and A.K.Pope. University of Queensland, Brisbane, Australia. Inversions from Chiang Mai, Thailand 2nd Report.

In November 1982 thirty-one isolines of D.s. albostrigata and five isolines of D.albomicans were established from Chiang Mai, Thailand.

Inversions in these species were last reported on from Chiang Mai in July 1982 (Mather & Pope DIS 59:82).

(a) D.s.albostrigata. Six simple inversions were detected. All inversions except one had previously been detected in East and Southeast Asia but of these E was new to Chiang Mai. A photograph of the new inversion (P6) is presented and breakpoints assigned (in relation to the standard photographic map)(Thongmeearkom 1977, DIS 52:154). Heterozygosity frequency of all inversions detected is given in Table 1.

(b) D.albomicans. Eight simple and one complex inversion were detected. Seven of the nine inversions had previously been detected in East and Southeast Asia but of these R5, A5 and W5 were new to Chiang Mai. Photographs of the new inversions (Q6 and R6) are presented and breakpoints assigned (in relation to the standard photographic map)(Mather & Thongmeearkom