eggs, dividing synchronously. The periods during which the cleavage furrow appears in all eggs are indicated by horizontal lines, and the cleavage numbers are given above the corresponding lines. Only cleavages 7 and 8 could not be actually observed in the microscope.

In the main figure the first part of the curve represents the respiration intensity of the oocyte and the unfertilized egg according to Lindahl and Holter⁴. As first described by Warburg⁵ and afterwards confirmed by many others, an increase in respiration intensity occurs just after fertilization. The part of the curve describing this increase is based on the results of Laser and Rothschild⁶, Runnström⁷ and others. During subsequent development, the respiration intensity increases according to Lindahl's curve, but the mitotic rhythm described is superimposed upon the S-shaped part of it. It should be emphasized that after hatching the mitotic activity of the germ is most probably very much reduced.

Thus, in the sea urchin egg as well as in the frog egg, the early cell divisions appear to be accompanied by distinct respiratory variations, the biochemical significance of which, however, remains to be elucidated. In developing anthers, Erickson⁸ found the respiratory intensity to vary in rhythm with the mitoses.

ERIK ZEUTHEN

Kristinebergs Zoological Station,
Sweden,

and
Laboratory of Zoophysiology,
University of Copenhagen.

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Rearing of *Trombicula acuscutellaris* Walch

In a previous communication¹ some successful feeding experiments with the adults of *Trombicula acuscutellaris* Walch on the eggs, ovaries and adults of *Mansonia (Mansonioides) uniformis* (Theobald) (*Tæniorhynchus (M.) uniformis*) were described. Since then, further proof of the carnivorous habits of this species has been obtained and adults have been fed on freshly killed Collembola and psocids. They are unable, however, to trap living Collembola or psocids, and it is unlikely that in Nature such active insects would be utilized as food. But for the routine feeding of nymphs and adults in the laboratory, it has been found more convenient to use culicine eggs, and for this purpose the eggs of *Culex fatigans* Wied. have been very largely used. These eggs are eaten with great avidity, and an ovipositing adult is capable of eating fifty or more eggs in 24 hours. By way of contrast, it may be mentioned that an adult of *T. deliensis* Walch, which is less than half the size of *T. acuscutellaris*, rarely eats more than two to four eggs in 24 hours and has never been known to exceed a maximum of nine eggs in that time.

The ease with which engorged larvæ could be reared to the nymphal stage in excavated glass blocks containing damp cellulose wadding has been

previously recorded². It has been found just as easy to rear nymphs to the adult stage on a diet of culicine eggs using the same technique. Oviposition commences within 10–12 days of the emergence of the adults. The eggs, which vary in colour from orange to reddish-orange, are invariably hidden by the female at the time of oviposition. The cellulose wadding gives them the opportunity of doing this, and it has been found that oviposition ceases if the wadding is changed to filter paper or plaster of Paris as recommended by Michener³.

The eggs, which hatch in 10–12 days, are picked out from the wadding in the glass blocks and placed on several thicknesses of wadding in specimen tubes measuring 2 in. × $\frac{1}{2}$ in. The wadding is then soaked with water up to the eighth day, after which cotton wool is wrapped around the inside of the cork. This takes up any excess moisture and prevents the larval mites from being trapped in droplets of moisture condensing in the tube.

White mice have had to be used as hosts, although they occasionally die, possibly as a result of being attacked by the mites, particularly when the numbers found attacking them are relatively large. This species is, however, not known to transmit *R. orientalis*.

The mice are placed in a wire cage the dimensions of which are 3 in. × 1 in. × 1 in., with a $\frac{1}{4}$ -in. mesh. If the cage is big enough for the mouse to move its front legs freely, wadding is packed in at the rear end so as to prevent this; otherwise the actively moving larval mites are vigorously brushed off the face and ears by the mouse. The cage is placed on a platform of wire mesh resting on a wire frame $\frac{1}{2}$ in. high, which in turn is placed in a circular glass dish 6 in. in diameter and 2 in. in depth.

The tube containing the larval mites is vigorously tapped so that all the mites are shaken to the bottom. The tube is then uncorked and the mites tapped out of the tube on to the head of the mouse. A glass cover is placed over the dish. The mouse is released from the cage about 17 hours later and placed in a fresh dish. In general, only about 20 per cent of engorged larvæ are recovered from the host. The majority of unengorged larvæ, owing to their extreme motility, are found running about the dish and glass cover on the second day and are discarded. From the second day onwards, a layer of cellulose wadding is placed in the dish and damped daily with 25 c.c. of water, the glass cover being removed after the first day. Engorged mites are found trapped in the damp wadding from the third to the seventh day, the largest number of mites being obtained on the fourth day. The mouse is fed on dry bread for the first four days and thereafter on damp bread.

Larval mites of *T. acuscutellaris* generally attach themselves to the inside of the ears, particularly the meatus, around the vibrissæ and to the upper and lower eyelids. The body of the host is only occasionally chosen as a site of attack.

This species has been reared to the fourth generation using this technique. A complete account of this investigation will be published elsewhere.

S. H. JAYEWICKREME

W. J. NILES

Division of Medical Entomology,
Colombo.
June 23.

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