GENERATION TIME OF THE MICROSPORIDIAN
**Octosporea muscaedomesticae** FLU IN ADULT
**Phormia regina** (Meigen)
(Diptera, Calliphoridae)*

By

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With 2 Figures in the Text

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**Introduction**

In a previous paper (Kramer, 1964) I described the principal stages within the developmental cycle of the muscoidophilic microsporidian **Octosporea muscaedomesticae** FLU. In that same paper I noted that numerous spores and some vegetative forms of this parasite are present in intestinal epithelium of flies five to eight days after the flies have ingested ripe spores. The present study was undertaken to get a more precise picture of the generation time of this parasite, that is, the time required for the parasite to complete its development from spore to spore within the proximal intestine of the host. Also considered are the times at which intervening forms appear. The results of this study provide us with fundamental information on the life history of the parasite which in turn gives us some insight into the epizootiology of muscoid-fly octosporeosis, a little-known disease that may act to suppress fly populations in the field.

**Materials and Methods**

An inoculum containing $2 \times 10^8$ spores per ml was prepared by thoroughly blending homogenated intestines from diseased flies with a five percent sucrose solution. By means of a method described previously (Kramer, 1964), this inoculum was fed to groups of 30 to 35 young healthy laboratory-reared flies that had been held in cages without food or drink for 24—30 hours following eclosion. These hungry flies were permitted to feed on the contaminated sucrose solution for about one hour. During that time all flies had taken at least one meal. Since an imaginal Phormia regina may ingest from .01—.04 ml of liquid during a single meal (Melnick and Penner, 1947), one may safely assume that each fly in the present study ingested no less than two million spores. Following the spore-contaminated meal

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the caged flies were given an ample supply of fresh water and a mixture of powdered milk and sucrose. The cages of flies were held at 23–27°C for the duration of the experiment.

To follow the development of the parasite, a portion of the flies were killed and processed as follows: after one hour and at four-hour intervals for 96 hours, the proximal intestines of six flies were removed. Four of the gut samples taken at each interval were smeared on coverslips, fixed in methanol, and stained in Giemsa’s solution. The other two gut samples in each series were fixed in Schaudin’s fluid, embedded in paraffin, sectioned, and stained with Giemsa’s solution. All tissue preparations were mounted in HSR medium and studied under oil immersion.

The findings are summarized in the Table.

To get some indication of the generation time of the parasite as might be reflected in the quantities of spores present in the feces, a clean glass slide was introduced into one cage of inoculated flies. After 24 hours the slide was removed and replaced by a fresh one. This process was repeated at 24 hour intervals for 144 hours. One-tenth of a ml of water was added to 10 dried fecal spots on each of the six slides. The fecal spots dissolved quickly in the water and the resulting suspensions were thoroughly stirred. By means of a Petroff-Hauser counter the concentration of spores in each sample was determined. The results are given in Figure 1.

Results and Interpretations

The essentials of the results are summarized in the Table. Entries under the heading “Hours At Which Stages Found” represent a composite of the findings for each series of smears and sections at a given inter-