ENDOMITOSIS IN *Drosophilia virilis*

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THURSDAY PM

BENCH 25

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INTRODUCTION

Endomitosis is the replication of chromosomes without the division of the cell nucleus (Therman and Stubblefield, 1983). It occurs in *Drosophilia melanogaster*. *Drosophilia melanogaster* and *Drosophilia viridis* are both fruit flies but are of different species origin. *Drosophilia viridis* is larger and less popular than *Drosophilia melanogaster* (Mathog *et. al*., 1984). This experiment sought to test the hypothesis that if endomitosis occurs in the salivary glands of *Drosophilia melanogaster* larvae then it also occurs in the salivary glands of *Drosophilia viridis* larvae since they both have polytene chromosomes.

Polytene chromosomes are larger in size (Therman and Stubblefield, 1983), have alternating light and dark bands, have puffs which are localized regions where the multiple strands of the chromosome decompress and have multiple arms that originate from a shared chromo center since all the chromosomes remain associated at their centromeres (Hartwell *et. al.*, 2011). If all these characteristics are observed on the *Drosophilia viridis* chromosomes under a compound microscope after dissecting its larvae's salivary glands, then the hypothesis that if endomitosis occurs in the salivary glands of *Drosophilia melanogaster* larvae then it also occurs in the salivary glands of *Drosophilia viridis* larvae since they both have polytene chromosomes will be supported.

RESULTS

The chromosomes of *Drosophilia viridis* (FIG 1) are relatively larger in size than the human chromosomes, (FIG2) which are mitotic chromosomes even though they were both viewed through the compound microscope at 40X magnification. The chromosomes of *Drosophilia viridis* (FIG 1) also has alternating light and dark bands which are a constant pattern, puffs which are localized regions where the multiple strands of the chromosome decompress and multiple arms that originate from a shared chromo center since all the chromosomes remain associated at their centromeres. The human chromosome (FIG 2) does not have any of these features however. It is just really small and has an 'X' shape since it was obtained from a female human. The first image (FIG 1) was obtained from Justin Atkin (Bench 17) and the second (FIG 2) from Kelsey Vallee (Bench 20).

DISCUSSION

In comparison to the human chromosomes (FIG 2), the *Drosophilia viridis* chromosome (FIG 1) is a polytene chromosome since it is larger in size (Mathog *et. al*., 1984), has alternating light and dark bands, has puffs which are localized regions where the multiple strands of the chromosomes DNA decompress to allow genes to be highly transcribed and has multiple arms that originate from a shared chromo center since all its chromosomes remain associated at their centromeres (Hartwell *et al.*, 2011). *Drosophilia viridis* chromosomes (FIG 1) have a lot of shared characteristics with *Drosophilia melanogaster* chromosomes (FIG 2) and *Drosophilia viridis* chromosomes (FIG 1) are a lot bigger than mitotic human female chromosomes (FIG 2), which is obvious from observing FIG 1 and FIG 2. The results of the experiment clearly demonstrate a lot of similarities between *Drosophilia viridis* and *Drosophilia melanogaster* chromosomes.

In conclusion, the hypothesis that if endomitosis occurs in the salivary glands of *Drosophilia melanogaster* larvae then it also occurs in the salivary glands of *Drosophilia viridis* larvae since they both have polytene chromosomes was supported.

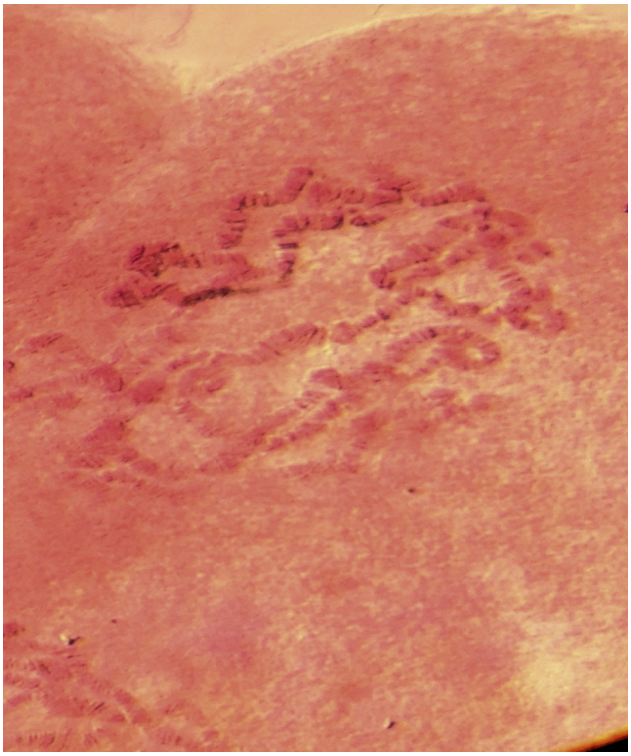

FIG I: Polytene Chromosomes in the Salivary Glands of *Drosophilia viridis* Larvae Observed Under a Compound Microscope With 40X Magnification.

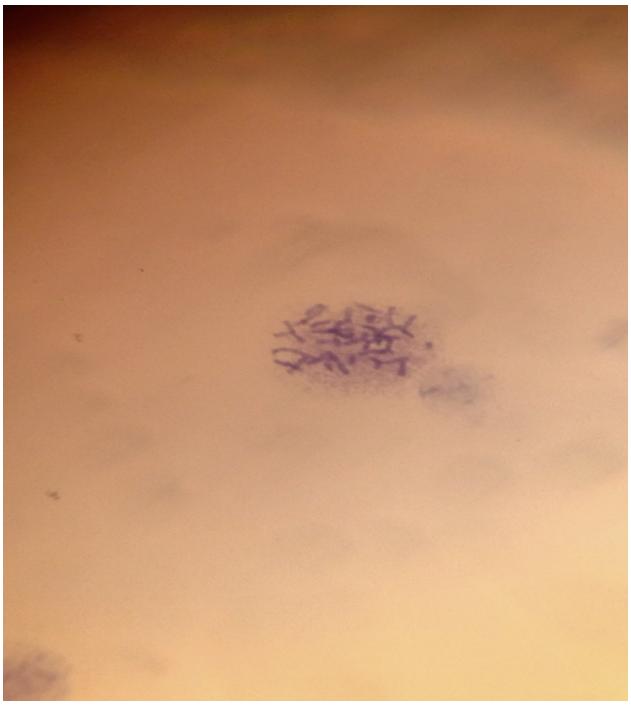

FIG II: Human Chromosomes Observed Under a Compound Microscope With 40X Magnification Isolated from Human Samples.

REFERENCES

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Therman E. Sarto G.E., Stubblefield P.A. (1983). Endomitosis: a reappraisal. *Human Genetics Journal*. 63: 13-18.