
Beta-galactosidase activity of adult flies was measured by a method modified from Sellinger et al (1) using 5mM o-Nitrophenyl-β-D-galactoside (Sigma) as the substrate. In preliminary experiments (Figure I) the optimal buffer and pH were determined. Citrate-phosphate buffer (ionic strength 0.05) at pH 5.6 was chosen for all subsequent experiments on the basis of these results. An adult homogenate prepared as follows was used as the enzyme source. A number of flies sufficient to give a final concentration of 5 flies/0.5ml (minimum number necessary for a detectable reaction) were hand homogenized in cold 0.25M sucrose with added Triton X-100 (0.01%)(Rohm and Haas). Since beta-galactosidase is typically a lysosomal

![Graph showing Beta-galactosidase activity per gamma protein in the pH range 4.4-8.0. Three buffers (ionic strength 0.05) were employed as indicated. All reactions were carried out at 25°C for 2 hours.](image_url)

Figure I. Beta-galactosidase activity per gamma protein in the pH range 4.4-8.0. Three buffers (ionic strength 0.05) were employed as indicated. All reactions were carried out at 25°C for 2 hours.
enzyme in other animals the Triton X-100 was used to rupture the lysosomal membranes. The homogenate was centrifuged at high speed in a clinical centrifuge, the precipitate rehomogenized and centrifuged as before. After the final centrifugation the supernatants were combined, their volumes adjusted, and 0.5 ml aliquots were pipetted into tubes containing 1.25 ml buffer and 0.5 ml substrate. The reaction was allowed to proceed for 2 hours at 25°C, and was stopped by plunging the tubes into an ice bath. The amount of o-nitrophenol liberated by the enzyme was measured colorimetrically at 420 nm immediately after adding 0.5 ml 1M NaOH to each tube. Protein determinations were performed according to the method of Lowry (2). The results of the assay were expressed as um o-nitrophenol per gamma protein.

The enzyme determinations were run on non-axenic live yeast fed adults (P1) and on 2 successive axenic generations of adults (P2 and P3) raised on sterile medium containing 0.5% Brewer's yeast, 1.5% agar and either 0.8% sucrose or 0.8% lactose. All tests were made on flies 2 to 5 days of age. In Table I the beta-galactosidase activities of the axenic lactose

<table>
<thead>
<tr>
<th>Generation</th>
<th>No. of Tests</th>
<th>Mean o-N-phenyl/ gamma protein</th>
<th>Lactose Fed</th>
<th>Mean o-N-phenyl/ gamma protein</th>
<th>Sucrose Fed</th>
<th>Mean o-N-phenyl/ gamma protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>3</td>
<td>0.336</td>
<td>Lactose</td>
<td>4</td>
<td>0.14</td>
<td>4</td>
</tr>
<tr>
<td>P2</td>
<td>4</td>
<td>0.14</td>
<td></td>
<td>4</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>5</td>
<td>0.73</td>
<td></td>
<td>5</td>
<td>0.47</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 5% level

and sucrose raised are compared to each other. These results are not compared to the P1 generation since it is probable that bacterias may be biasing the result by contributing to the total enzyme activity.

Beta-galactosidase levels were highest in the P3 adults after an initial, though non-significant decrease. It appears that the lactose fed flies have the greatest enzyme activity.


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We have undertaken a cytogenetic investigation of deficiencies located in the proximal region of the X chromosome covered by the y+ mal+ chromosome (Schalet and Finnerty, DIS 43: 128). Salivary analysis based upon at least 12 deficiencies of independent origin permits the following preliminary observations.

1) Cytological extent of the proximal X chromosome covered by y+ mal+: From a left breakpoint in 18F through sections 19 and 20.

2) Location of visible loci: ot, 19A3-6; sw and mel, 19B3-19C2; mal, 19C4-19D3; If, 19E5-6; unc, 19F1-2; su(f), to the right of 20A2 (probably to the right of 20A). The "mal" locus of Lifschytz and Falk, (see note of Schalet and Finnerty in this issue), defined by the overlapping deletions A118/Q539, 19E7 or immediately next to it.

3) Lethal loci in section 20: Lethal A7 has been localized to 20A1-2. Complementation tests have demonstrated at least 7 lethal loci between lethal A7 and su(f). Consequently, these 7 lethals and su(f) are located within bands generally considered to be truly chromocentral. Since su(f) is to the left of the proximal breakpoint of the sc4 inversion, these results are in conflict with Cooper's assignment of 19F for that breakpoint.