ablation. Group C animals (10 crabs) were each injected with 0.05 ml of sea water. During the period of experimentation the crabs were fed twice weekly on pieces of fish. The experiment was continued until all the crabs had moulted, and the duration of proecdysis in each crab was noted. The experiment was repeated once, and the results are shown in the Table.

From the Table, it is evident that the isolated fraction of the eyestalk ganglia has a pronounced moult-inhibiting effect. The proecdysal duration of the eyestalkless *Ocypode* that were injected with a dose of 2 $\mu$g of the isolated fraction is significantly higher ($P = < 0.001$ in both the experiments) than the values of untreated animals and those injected with sea water. The differences in proecdysial duration between the untreated eyestalkless crabs and those injected with sea water are not statistically significant.

Proecdysial duration in the Crab *Ocypode macrocera*

| Experiment no. | Experimental group | No. of crabs | Treatment | Duration of proecdysis (in days mean ± S.D.) |
|---|---|---|---|---|
| I | A | 10 | Untreated eyestalkless crabs | 20.8 ± 1.5 |
| | B | 12 | Eyestalkless crabs injected with the isolated fraction of the eyestalk | 36.8 ± 3.7 |
| | C | 10 | Eyestalkless crabs injected with sea water | 21.3 ± 2.2 |
| II | A | 8 | [a] | 19.5 ± 0.7 |
| | B | 9 | [a] | 38.8 ± 3.3 |
| | C | 8 | [a] | 20.1 ± 1.2 |

[a] Treatment same as in experiment I.

The isolated fraction showed no chromatophorotropic activity when tested on chromatophores of *Ocypode*, *Palaemon* and *Metapenaeus*. It has no effect on premoult water uptake in the crab, *Ocypode macrocera*. In the light of these observations, the isolated fraction was identified as the moult-inhibiting hormone, with the implicit reserve that further experiments as to its effect on other metabolic changes in relation to the moult cycle are necessary to confirm this statement.

Tests on solubility properties revealed that the hormone is soluble in ethanol, methanol and phenol. It is insoluble in acetone, ether and chloroform. Ascending paper chromatography, using a water saturated mixture of *n*-butanol and amyl alcohol as the solvent, revealed that the hormone has an Rf value of 0.54. The hormone is inactivated by 1:1000 trypsin. It is concluded that the moult-inhibiting hormone is most likely a peptide[9].

*Résumé.* Un fragment soluble dans le phénol de pédoncule oculaire du Crabe *Ocypode macrocera* a, sur la mue, un effet inhibitif prononcé. Cette inhibition est sans effet sur les chromatophores et sur l'absorption de l'eau pendant la pré-mue du crabe. L'hormone est soluble dans l'éthanol, le méthanol et le phénol et inactivée par la trypsine. L'hormone d'inhibition de la mue paraît être une peptide.

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[9] Acknowledgments: The author is grateful to Dr. NAGABHUSHANAM for guidance, to Prof. P. N. GANAPATI for facilities and keen interest in the work, and to the Government of India for the award of a scholarship.

## Studies of Selective Mating Using the Sex-Linked Mutants *White* and *Bar* of *Drosophila melanogaster*

A previous paper[1] was devoted to the measurement of sexual isolation between the melanistic mutants *ebony* ($e^{11}$) and *black* of *Drosophila melanogaster*, and their wild-type allele. This one concerns the two sex-linked mutant genes *white* and *Bar*. Exactly the same methods were used. The degree of sexual isolation was determined according to the 'multiple choice method' by direct observation of 100 flies (25 pairs of both strains), 4 or 5 days old, introduced together in a wooden box covered by a thick glass, the copulating pairs being recorded at intervals of 5 min on a paper reproducing the same grid as the chequered canvas extended beneath the box. The locomotor activity of the fly in a group was determined according to EWING[2], 25 flies of the same sex and strain being introduced together in the first of a series of 6 tubes and the number of flies in each tube being recorded at 3 min intervals.

The results of the observations concerning selective mating are given in Table I as cumulated percentage of females fertilized in each mating type. The graphic expression of such data would be exponential curves approaching a plateau, but it is possible to turn it into straight lines by logarithmic transformation, using the WATTIAUX formula

$$dx_A / (n_A - x_A)\, dt = b\, K\, e^{-K t},$$

where $n_A$ is the total number of individuals of one sex and genotype, $dx_A$ the number of flies mating at the intervals of time $dt$, and $K$ and $b$ constants which can be calculated from the regression line fitting to the transformed data[3]. The values of measurement becoming independent of time, any bias due to the few copulations taking place eventually after the $2^1/_2$ h of observation is avoided. Figure 1 (time in abscissa and values $dx_A/n_A - x_A$ in ordinate) gives the regression lines permitting comparison

[1] A. A. ELENS, Exper. *21*, 145 (1965).
[2] A. W. EWING, Anim. Behav. *11*, 369 (1963).
[3] J. M. WATTIAUX, Z. Vererblehre *95*, 10 (1964).

between: (1) homogamic and heterogamic matings; (2) mating of females of the first and the second genotype; and (3) matings of males of the first and the second genotype. The differences between homogamic and heterogamic regression lines are never significant, neither are those between the regression lines concerning the females. The differences between the activities of the *white* and *Bar* males are also non-significant, but the activity of *wild* males (Canton special) is certainly superior. All this is in very good accordance with the conclusions drawn after the application of a chi-square to the classical 'isolation estimate', 'female mating ratio', and 'male mating ratio' (Table II), except for the activity of *white* and *Bar* males, for which the chi-square seemed to indicate a significant difference in favour of the *Bar*. A similar discordance between the two methods was also observed in the previous experiments concerning *black*, *ebony* and *wild*, differences considered as significant after a chi-square test not being confirmed by the more accurate covariance test.

Figure 2 gives the regression lines fitting the data concerning the motor activity levels, the means of the 10 repetitions being plotted as percentage of possible moves in function of time. For *wild*, *black* and *ebony*, the concordance was very good between the locomotor and sexual activities of the males; *wild* being the most active and *ebony* the least. In the present case, the differences are never significant, except for the *white* females being decidedly more active than the *wild* ones. It must be remarked that in the present case the locomotor activities of the *wild* flies (males and females) are strangely lower than in the preceding experiments concerning the melanistic mutants. It seems that uncontrolled factors (other than light and temperature, controlled in this case) could influence the level of locomotor activity without acting on sexual activity. Indeed the superiority of *wild* males remained unchanged and could account for the rapid elimination of the *white* and *Bar* genes from populations in which they are in competition with their wild-type alleles.

Table I. Cumulative percentage of fertilized females

| Time in min: | 20 | 40 | 60 | 80 | 100 | 120 |
|---|---|---|---|---|---|---|
| *wild* × *white* (10 × 25 pairs) | | | | | | |
| ♂ *wild* × ♀ *white* | 36.8 | 48.0 | 49.2 | 50.4 | 51.2 | 51.6 |
| ♂ *wild* × ♀ *white* | 34.8 | 44.0 | 46.0 | 46.8 | 46.8 | 46.8 |
| ♂ *white* × ♀ *white* | 16.8 | 21.6 | 22.0 | 22.0 | 22.0 | 22.0 |
| ♂ *white* × ♀ *wild* | 15.6 | 20.4 | 21.6 | 22.0 | 22.0 | 22.0 |
| *wild* × *Bar* (10 × 25 pairs) | | | | | | |
| ♂ *wild* × ♀ *wild* | 29.2 | 38.8 | 43.6 | 45.2 | 45.6 | 46.0 |
| ♂ *wild* × ♀ *Bar* | 21.2 | 33.2 | 38.4 | 40.8 | 41.6 | 41.6 |
| ♂ *Bar* × ♀ *Bar* | 14.8 | 23.6 | 26.8 | 28.4 | 28.8 | 29.2 |
| ♂ *Bar* × ♀ *wild* | 10.8 | 20.8 | 24.4 | 25.6 | 25.6 | 25.6 |
| *Bar* × *white* (10 × 25 pairs) | | | | | | |
| ♂ *white* × ♀ *white* | 18.4 | 20.8 | 24.4 | 25.6 | 25.6 | 25.6 |
| ♂ *white* × ♀ *Bar* | 22.4 | 27.6 | 34.4 | 36.8 | 37.6 | 37.6 |
| ♂ *Bar* × ♀ *Bar* | 22.0 | 32.8 | 41.6 | 44.8 | 44.8 | 44.8 |
| ♂ *Bar* × ♀ *white* | 25.6 | 34.8 | 37.6 | 39.2 | 39.2 | 39.2 |

Table II. Calculated $X^2$ of the isolation estimate, the female mating ratio, and the male mating ratio derived from Table I

| | I | $X^2$ | M ♀ | $X^2$ | M ♂ | $X^2$ |
|---|---|---|---|---|---|---|
| *wild* × *white* | 0.93 | 0.23 | 2.23 | 29.18[b] | 1.06 | 0.20 |
| *wild* × *Bar* | 0.89 | 0.67 | 1.59 | 10.58[b] | 1.00 | 0.03 |
| *white* × *Bar* | 1.09 | 0.42 | 0.75 | 4.03[a] | 0.78 | 2.88 |

[a] $P < 0.05$ [b] $P < 0.0025$

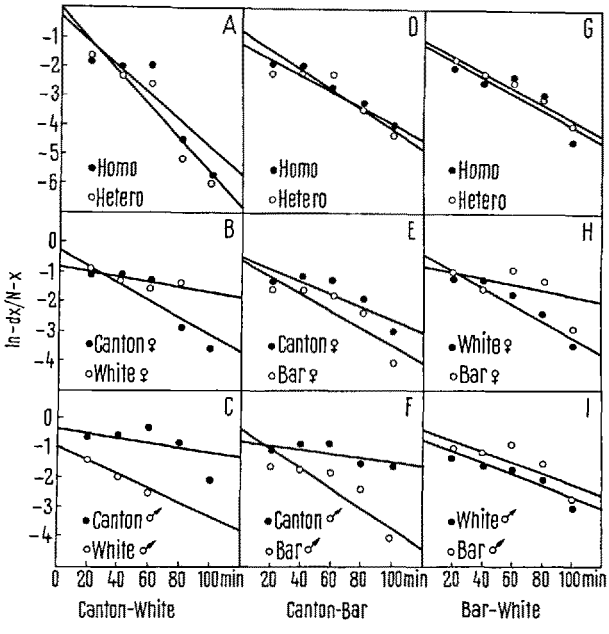


Fig. 1

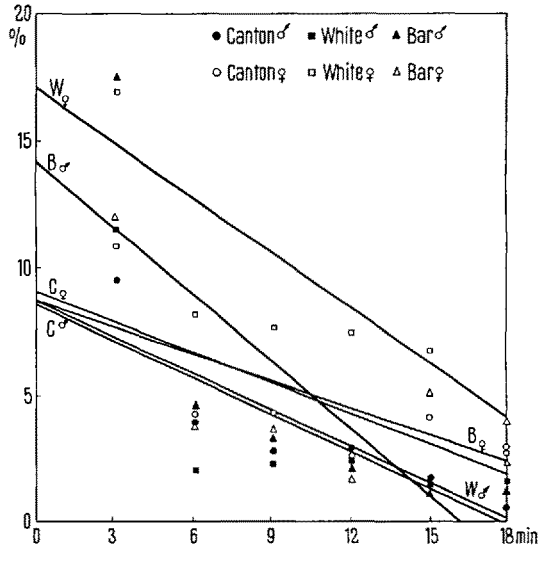


Fig. 2

*Résumé.* L'observation directe montre qu'il n'y a pas d'isolement sexuel entre le type *sauvage* (Canton special) et les mutants *Bar* et *white* de *Drosophila melanogaster*. L'activité sexuelle des mâles est nettement moindre chez *white* et *Bar*. Par contre les activités locomotrices ne semblent pas inférieures.

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