Tsuchiyama, S. and B. Sakaguchi. Kyushu University, Fukuoka, Japan. Disc electrophoresis of soluble proteins in sex-ratio female of D. melanogaster.

It has been demonstrated by Poulson and Sakaguchi (1961) that one class of the maternal sex-ratio (SR) condition in Drosophila is caused by an infection with SR spirochete. Male zygotes of the SR line are selectively killed by the SR spirochete but female zygotes are not, and the spirochete behaves as a symbiont in the body of the female.

The object of the present work was to elicit information on biochemical aspects of these differences between the two sexes for the selective killing.

Female and male flies of normal line, Oregon strain, and SR line of the same strain with nebulosa SR spirochete were used as a source for extraction of soluble proteins. Two young flies, two days after eclosion, were comminuted in 0.1 ml of Drosophila Ringer's solution containing 10% sucrose in a small glass homogenizer. To analyze for soluble proteins in the homogenates, 7.5% acrylamide gels for disc electrophoresis were prepared. The procedure of electrophoresis was carried out according to the method of Loening (1967). Gels were stained in 0.5% amido black in 7% acetic acid. Relative ratios of each band for quantitative amount of protein separated by electrophoresis were calculated from the results of electropherograms obtained by densitometer.

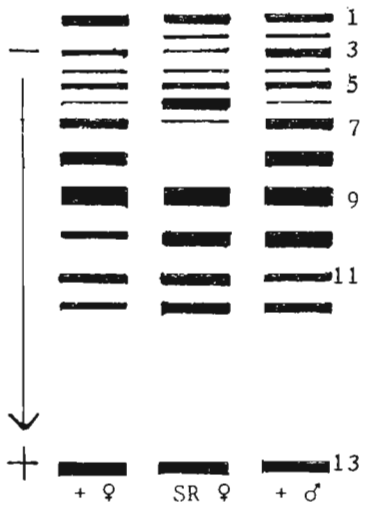

Fig. 1. Schematical electropherograms obtained from soluble proteins of normal and SR flies.

Table 1. Relative amount of each fraction of soluble proteins separated by disc electrophoresis

Fraction No.	Normal female	SR female	Normal male
1	12.5%	11.5%	8.3%
2	0	1.9	1.4
3	3.1	1.9	6.8
4	1.5	1.9	1.4
5	7.8	5.8	6.8
6	1.5	13.5	1.4
7	15.6	1.9	15.3
8	14.0	0	11.1
9	15.6	15.4	16.7
10	7.8	15.4	11.1
11	9.3	11.5	8.3
12	4.7	9.6	6.8
13	6.2	5.8	4.2

The electrophoretic patterns of the soluble proteins from the tested flies are schematically shown in Fig. 1. Normal female and male had very similar patterns except that the minor fraction 2 was entirely missing in the former. Relative ratios of the quantitative amounts, among each fraction, shown in Table 1, were also similar with some variation between normal female and male. However, the protein patterns obtained from SR females revealed very significant differences between normal female and male. Fraction 8, a major fraction found in both normal female and male, was completely absent in SR female as shown in Figure 1. It is interesting that minor fraction 2 found only in the normal male was also present in the SR female. Fraction 6 and 7 show considerable quantitative variations between normal and SR female: the ratios in the SR were elevated or degraded for fractions 6 and 7, respectively (Table 1). Furthermore, the ratios of fraction 10, 11 and 12 of SR female were raised in comparison with the corresponding fraction of normal female and male (Table 1). Further analyses on these differences of the protein patterns between normal and SR flies are now underway.

References: Poulson, D.F. and B. Sakaguchi 1961 Science 133:1489; Loening, U.E. 1967 Biochem. J. 102:251.

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