Sperlich, D. University of Tübingen, Germany. Lack of male recombination in D. subobscura.

Rare male recombination has been observed several times in D. melanogaster and other Drosophila species (for a review see Thompson and Woodruff 1978) including D. subobscura (Philip 1944). The phenomenon of male recombination (MR) is frequently accompanied by segregation distortion, mutator activity and sterility. The final cause for this MR syndrome is not yet clear but it might be due to DNA insertions analogous to IS elements of bacteriophages (Green, Golubowsky and others) or simply to hybrid dysgenesis (Sved, Thompson and others). Whatever the case might be the MR effect seems to become an important factor in population and evolutionary genetics.

Since D. subobscura is our favored species for population studies we have made a small experiment in order to investigate whether MR effects can be discovered in our otherwise studied populations. Two different mutant strains, "cn, ma" (most probably homologous to st and se of D. melanogaster, respectively) and "vg, pp" (vg = vg of D. melanogaster; pp = light red eyes, maybe cn of D. melanogaster). According to localization and linkage to a group of enzyme loci cn, ma must be on chromosome I of D. subobscura which corresponds to III L of D. melanogaster, whereas vg, pp must be on chromosome E of D. subobscura which is

vg,pp/vg,pp x vg,pp/+,+ ♂					cn,ma/cn,ma x cn,ma/+,+ ♂				
Wild Chrom. No.	Phenotype of offspring + +	vg pp	vg +	+ pp	Wild Chrom. No.	Phenotype of offspring + +	vg ++	vg +	+ pp
2	117	30	-	-	2	106	38	-	-
10	173	61	-	-	9	202	104	-	-
13	222	67	-	-	13	137	66	-	-
14	275	81	-	-	24	182	112	-	-
22	70	24	-	-	27	43	33	-	-
24	237	65	-	-	29	236	135	-	-
29	105	31	-	-	42	34	8	-	-
31	55	11	-	-	46	27	13	-	-
34	138	30	-	-	50	31	16	-	-
42	105	52	-	-	51	99	80	-	-
46	157	82	-	-	53	24	23	-	-
47	96	40	-	-	54	64	50	-	-
50	146	27	-	-	55	56	23	-	-
186	242	52	-	-	60	75	54	-	-
188	48	13	-	-	63	185	116	-	-
189	293	85	-	-	179	96	44	-	-
191	128	54	-	-	186	55	21	-	-
203	157	29	-	-	188	246	126	-	-
310	262	103	-	-					
311	85	21	-	-					
n=20	3111	958	-	-	n=18	1898	1062	-	-

homologous to II R of D. melanogaster. A number of wild males from Cinisy (Sicily) were crossed individually to cn, ma or vg, pp females. From the offspring heterozygous single cn ma/++ or vg pp/++ males respectively were back-crossed to ten or more mutant females in order to get a big enough number of offspring flies to detect any male recombination with a rate higher than 0.5%. The results are shown in the table.

There was not a single male recombination in any of the various wild chromosomes and no segregation distortion could be observed. The predominance of + + phenotype is due to the poor performance of the double mutant phenotypes. Segregation distortion, however, is expected to be effective against the + + chromosomes. There is no evidence for such an effect in any of the cultures. The results can certainly not be taken as a general proof of absence of male recombination in D. subobscura but might be an indication that the phenomenon is not a general one for all crosses, for all populations and all chromosomes of the genome.

(The technical assistance of Mrs. Stögerer and Miss Kaipf is highly appreciated.)

Stamatis, N.D. University of Patras, Patras, Greece. Male recombination elements in a southern Greek D. melanogaster population.

Since 1971 (Hiraizumi), chromosomes associated with male recombination elements have been isolated from natural populations of D. melanogaster, covering almost all the world. During the autumn of 1971 and in the course of a study which aimed to detect recessive lethals in a natural population of southern Greece, one lethal second chromosome (symbol 31.1) was discovered to be associated with male recombination element(s) (Yannopoulos and Pelecanos 1977).

The aim of the present communication which constitutes a part of a much wider investigation is to ascertain whether male recombination elements are still present in the same population and to estimate their frequencies.

Wild flies were collected in June 1977. Captured females were transferred individually on fresh food (consisting of a standard cornmeal medium) and were allowed to lay eggs for five days. All cultures were kept in 25±0.5°C.

The progenies of each captured wild female were then crossed in a brother-sister mass mating; thus, a number of wild lines were established. Afterwards, strains Cy/+;Ubx^{130}/+, bearing one second and one third chromosome from each wild line, were established by the following procedure:

G_1: +/+;+/+ x Cy/bw^{vI}; Ubx^{130}/Sb* (1 ♀ x 3 ♂)

G_2: Cy/+;Ubx^{130}/+ x Cy/bw^{vI};Ubx^{130}/Sp (1 ♀ x 3 ♂)

G_3: Cy/+;Ubx^{130}/+ x Cy/+;Ubx^{130}/+ (1 ♀ x 1 ♂)

↓

strain Cy/+;Ubx^{130}/+

In order to determine whether the wild chromosomes of these strains have the ability to induce male recombination along the second chromosome, males Cy/+;Ubx^{130}/+ were mated with dp b cn bw;ve virgin females. The F_1 +/dp b cn bw;+/ve and +/dp b cn bw;Ubx^{130}/ve sons (at least ten for each case) were then separately selected and individually mated with dp b cn bw; ve virgin females (see Table 1; crosses A and B, respectively). The F_2 progenies of both crosses were scored for recombinants until the 18th day after setting up the matings.

Among the 23 strains tested 13 (56.52%) have shown an association with MR elements, for they yielded male recombination frequencies higher than those of the control (see Table 1, line 14). Moreover, the spontaneous level of male recombination frequency is known to be 0-8/10,000 (Demerec 1965). For control, F_1 Canton/dp b cn bw Canton/ve males derived from Canton (wild type stock) fathers were mated with dp b cn bw; ve virgin females and their progeny were scored for recombinants.

The results show that the presence of the wild third chromosome influences male recombination along the second chromosome.

Our data do not allow us to suggest that one or more of the MR elements are identical

*For description, see Lindsley and Grell (1968).