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Induction of dominant temperature sensitive lethals into the CyO balancer, (In 2LR)O, and the Pm balancer, (In2LR)bw^{V1}, chromosomes.

Certain selection schemes for the recovery of mutations could be run more efficiently if an autosomal balancer chromosome were available which also carried a dominant temperature sensitive mutation (DTS). For this reason an attempt was made to induce a DTS into the Pm, CyO, TM2, and TM3 chromosomes.

Males heterozygous for the balancer chromosome were fed with 0.025M EMS in 1% sucrose (Lewis and Bacher, DIS 43:193, 1968). Virgin females were collected using Wright's method (DIS 44:63, 1969) except Cross 1 virgin females were collected in the usual way.

Scheme for inducing a DTS into the Pm balancer.

Cross 1 OR virgin ♀♀ X Pm/mr bs^2 EMS fed ♂♂

$22^{\circ}C$

Cross 2 (5 $\overline{XX}$/Y virgin ♀♀ X 1 Pm*/+ ♂)$_n$

Vial 1 at $22^{\circ}C$ — After 4 days transfer parents → Vial 2 at $30^{\circ}C$

Live	Pm*/+	Pm-eyed	Die
Live	+/+	Red-eyed	Live

If no Pm-eyed flies hatch in Vial 2 at $30^{\circ}C$ go back to Vial 1 at $22^{\circ}C$ and isolate the Pm,DTS chromosome.

Of 690 Cross 2 vials made, 616 vials were analyzable at $30^{\circ}C$ and one DTS was found and designated Pm,DTS18.

Scheme for inducing a DTS into the CyO chromosome.

Cross 1 bw;st virgin ♀♀ X CyO/Pm;st/st EMS fed ♂♂

$22^{\circ}C$

Cross 2 (5 $\overline{XX}$/Y;bw;st virgin ♀♀ X 1 CyO*/bw;st/st ♂)$_n$

Vial 1 at $22^{\circ}C$ — After 4 days transfer parents → Vial 2 at $30^{\circ}C$

Live	CyO*/bw;st/st	scarlet-eyed	Die
Live	bw/bw;st/st	white-eyed	Live

If no scarlet eyed flies hatch in Vial 2 at $30^{\circ}C$ go back to Vial 1 at $22^{\circ}C$ and isolate the CyO,DTS chromosome.

Of 1834 Cross 2 vials made, 1555 were analyzable at $30^{\circ}C$ and three CyO chromosomes were found containing a DTS. These have been designated as CyO,DTS100, CyO,DTS486, and CyO,DTS513.

An attempt was made to induce a DTS into TM2, Ubx^{130} and TM3, Ser Sb using a crossing scheme analagous to that used for the CyO chromosome. Of 2513 Cross 2 vials made, 2285 vials were analyzable at $30^{\circ}C$ and none of the third chromosomes tested had a DTS.

The balancer DTS chromosomes were tested by making reciprocal crosses to flies from an OR stock in 1/2 pint bottles at $30^{\circ}C$. For all crosses duplicate cultures were made with bottles containing 20, 10, and 5 parental pairs. Data from duplicate cultures were lumped together.

The results in Table 1 and Table 2 indicate that as far as the testing went, all the DTS chromosomes (except CyO,DTS486) were completely lethal at $30^{\circ}C$. Pm,DTS18 and CyO,DTS486 female heterozygotes are almost completely sterile at the restrictive temperature. Earlier experiments in an incubator which fluctuated between 28.5 and $30.0^{\circ}C$ indicated there may be up to 2% escapers for Pm,DTS18 and CyO,DTS513, and 0.1% for CyO,DTS100.

Although it is possible to maintain the DTS stocks at $25^{\circ}C$, they grow much better be-

tween 21 and 23°C.

Since out of 2285 EMS-treated chromosomes no TM2, Ubx^{130} nor TM3, Ser Sb chromosomes were recovered carrying a DTS and since Suzuki, D.T. (Science 170:695-706, 1970) reports a very low induced mutation rate for DTSs on the third chromosome, the attempt to induce new DTSs in the third chromosome balancers was abandoned. Instead, DTS-1165 of Suzuki located between h and st was crossed-over into the TM2, Ubx^{130} chromosome. When flies from the presently available

Table 1. Test of the Pm,DTS18 isolate.

Cross	# Parental Pairs	CyO Progeny ♀♀	CyO Progeny ♂♂	Pm,DTS Progeny ♀♀	Pm,DTS Progeny ♂♂
Pm,DTS18/CyO ♀♀ x OR ♂♂	20	5	0	0	0
	10	3	0	0	0
	5	1	0	0	0
	Total	9	0	0	0
OR ♀♀ x Pm,DTS18/CyO ♂♂	20	292	326	0	0
	10	215	210	0	0
	5	133	155	0	0
	Total	640	691	0	0

Table 2. Test of the CyO,DTS isolates.

Cross	# Parental Pairs	Tft Progeny ♀♀	Tft Progeny ♂♂	CyO,DTS Progeny ♀♀	CyO,DTS Progeny ♂♂
CyO,DTS100/Tft ♀♀ x OR ♂♂	20	333	284	0	0
	10	236	210	0	0
	5	127	112	0	0
	Total	696	606	0	0
OR ♀♀ x CyO,DTS100/Tft ♂♂	20	283	281	0	0
	10	188	180	0	0
	5	143	115	0	0
	Total	614	576	0	0
CyO,DTS486/Tft ♀♀ x OR ♂♂	20	0	1	0	0
	10	0	1	0	0
	5	0	1	0	0
	Total	0	3	0	0
OR ♀♀ x CyO,DTS486/Tft ♂♂	20	299	330	29	10
	10	202	200	12	7
	5	140	151	13	4
	Total	641	681	54	21
CyO,DTS513/Tft ♀♀ x OR ♂♂	20	290	283	0	0
	10	217	205	0	0
	5	92	86	0	0
	Total	599	574	0	0
OR ♀♀ x CyO,DTS513/Tft ♂♂	20	159	165	0	0
	10	116	114	0	0
	5	185	198	0	0
	Total	460	477	0	0

TM2, Ubx^{130} DTS-I165/Sb stock were reciprocally crossed at 30°C to flies from an Oregon-R wild type stock no Ubx progeny survived in the +/+ ♀♀ x TM2, Ubx^{130} DTS-I165/Sb ♂♂ cross, but in the reciprocal cross 7% of the progeny were Ubx,non-Sb. In addition TM2, Ubx^{130} DTS-I165/ ru h th st cu sr e^s ca ♀♀ have been checked for crossing-over. Exchanges involving ca occurred with a frequency of .026. The frequency in the ru-h region was .003 and in the h-th region .005.

Supported in part by National Science Foundation Grant GB-20910 and National Institutes of Health Traineeship Number 1 TOL GM 01450-01A1.

Hunter, A.S. University of the Pacific Stockton, California. Distribution of Drosophila of Gothic, Colorado.

During a 5-week visit in June and July of 1971 at the Rocky Mountain Biological Laboratory in Gothic, Colorado, collections of Drosophila were made in two different community types in order to compare the distribution of species. A banana and yeast bait was spread on the ground in the shade of trees and sweepings were made at half hour intervals during the day. The species collected were the same as those found by Dr. D.D. Miller in 1963. The number of each species collected in each community type is shown in Table 1.

Table 1. Drosophila collections Gothic July 1971

Site 1 Aspen community

	athabasca	pseudoobscura	montana	subquinaria	suboccidentalis	Totals
Week 1	7	6	45	34	37	129
Week 2	7	23	42	69	34	175
Week 3	13	36	64	38	30	181
Total	27	65	151	141	101	485

Site 2 Spruce community

Week 1	30	18	10	14	26	98
Week 2	22	27	11	27	36	123
Week 3	26	23	19	15	34	117
Total	78	68	40	56	96	338

At that time of year, D. montana, D. subquinaria and D. suboccidentalis were the most abundant species. Of the five predominant species collected, three differed in the number collected in an aspen community as compared with those collected in a spruce-fir community. D. subquinaria and D. montana were collected in greater numbers in the aspen community while with D. athabasca the reverse was found. An analysis of variance of the data of Table 1 is shown in Table 2.

Table 2. Analysis of variance

	Sum of squares	Degrees freedom	Mean square	F
Species	1,224	4	306	3.4
Location	719	1	719	7.9
Interactions	2,978	4	745	8.3
Deviations	1,802	20	90	

Conclusions

Significant effect of location	P = 0.005
Questionable effect of species	P = 0.05
Definitely significant interaction	P = 0.005

These preliminary data support the hypothesis that some species are more abundant in certain community types.