Authors who described the deposition of pteridines in imaginal discs are I. Scheneider (1964) and E.W. Hanley et al. (1967), who concluded that a similar pigment deposition was found between 65 hours pupae explants and "in vivo". These results do not agree with the ones shown in Figure 1, probably due to the use for these authors of a not very efficient system for the analysis of pteridines.

References: Hanley, E.W., C.W. Fuller and M.S. Stanley 1967, J. Embryol. Exp. Morph. vol. 17, 3:491-499; Horikawa, M. 1959, Cytologia 23:468-477; Mandaron, P. 1973, Develop. Biol. 31:101-113; Scheneider, I. 1964, J. Exp. Zool. 156:91-104.

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Seasonal variation among gene arrangements in *Drosophila robusta.*

When encountered, seasonal changes in observed frequencies of gene arrangements in natural populations of *Drosophila* are often considered results of genotypic changes driven by natural selection (Dobzhansky, 1948; Carson and Stalker, 1949; Levitan, 1973). Populations of *D. robusta* that have been monitored for temporal variation in gene arrangement frequencies vary in the extent of seasonal or long term genetic changes. Missouri populations show few chromosomal responses to seasonal variation and virtually no changes in gene arrangement frequency over time intervals as long as ten years (Carson, 1958). Pennsylvania, Virginia and Tennessee populations show seasonal changes (Levitan, 1973) with the latter population also showing long term frequency changes (Etges, 1984). Differences in the capacity for such microevolution is clearly of interest, yet much more information is needed on the frequency and overall pattern of temporal changes among populations, as well as the mechanisms involved.

Table 1. Inversion frequency differences between a Fayetteville, BY, and Ozark Mountains, SL, population of Drosophila robusta. Both population were sampled during October and November, 1987.

Gene arrangement	BY	SL	X^2
XL	0.615	0.154	
XL-1	0.221	0.480	51.62^{****}
XL-2	0.164	0.366	
n	104	123	
XR	0.192	0.041	
XR-1	0.337	0.049	52.95^{****}
XR-2	0.471	0.910	
n	104	123	
2L	0.320	0.313	
2L-1	0.523	0.453	3.99^{ns}
2L-2	0.133	0.167	
2L-3	0.024	0.067	
n	128	150	
2R	0.867	0.827	0.87^{ns}
2R-1	0.133	0.173	
n	128	150	
3R	0.344	0.253	2.72^{ns}
3R-1	0.656	0.747	
n	128	150	

**** $P < 0.0001$, ^{ns}not significant

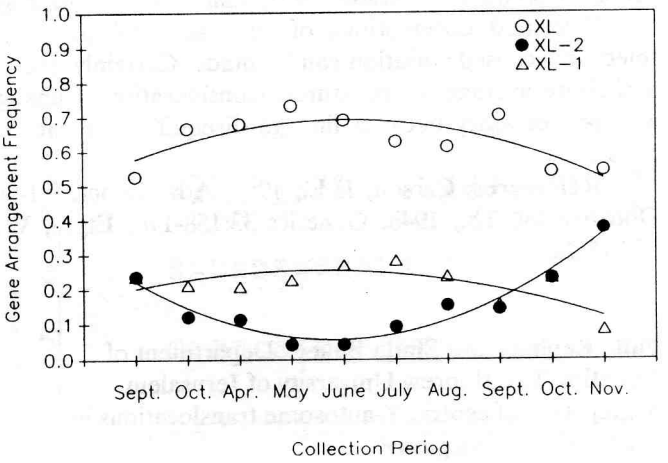

Figure 1. Seasonal shifts in gene arrangement frequencies of the left arm of the X chromosome in a population of *D. robusta* from Fall 1987 to 1988. Quadratic regressions of frequency on collection period are plotted for each gene arrangement: for XL, r^2 = 0.59, for XL-1, r^2 = 0.56, and for XL-2, r^2 = 0.94.

Two populations of *D. robusta* were surveyed for inversion polymorphisms in northwestern Arkansas. No published data of *D. robusta* inversion frequencies in Arkansas is currently available, and the closest populations within the same geographical area, the Ozark Plateau, studied by Stalker, Carson, and their students have not been recently resurveyed, In Fayetteville, a population inhabiting a woodlot near a residential area was sampled weekly for 13 months. A population from the Ozark National Forest, about 60 miles southeast of Fayetteville, was sampled 5 times over a two month interval. Flies from both populations were collected by sweep-netting over buckets of fermenting bananas. Females were separated into individual vials and supplied with a wild caught male. Immature adults were pairmated in the lab and 1 larva from each cross was karyotyped.

Table 2. Seasonal variation among gene arrangements in a population of Drosophila robusta. Collections started in the Fall of 1987 and continued until the Fall of 1988. The number of sex chromosomes, n^x, and autosomes, n^a, sampled are given for each collecting period. x^2 statistics from tests of homogeneity across collecting periods are shown.

Collecting Period	XL	XL-1	XL-2	XR	XR-1	XR-2	n^x	2L	2L-1	2L-2	2L-3	2R	2R-1	3R	3R-1	n^a
1987																
9/24-10/8	0.526	0.237	0.237	0.158	0.342	0.500	38	0.375	0.542	0.083	0.000	0.875	0.125	0.354	0.646	48
10/9-10/22	0.667	0.212	0.121	0.212	0.333	0.455	66	0.288	0.512	0.163	0.037	0.863	0.137	0.338	0.662	80
1988																
4/9-5/16	0.679	0.208	0.113	0.132	0.340	0.528	53	0.397	0.471	0.103	0.029	0.897	0.103	0.323	0.677	68
5/17-5/31	0.732	0.226	0.042	0.216	0.342	0.442	190	0.309	0.555	0.089	0.047	0.898	0.102	0.411	0.589	236
6/1-6/30	0.690	0.268	0.042	0.262	0.399	0.339	168	0.284	0.574	0.113	0.029	0.843	0.157	0.407	0.593	204
7/1-7/31	0.627	0.281	0.092	0.184	0.424	0.392	217	0.364	0.477	0.121	0.038	0.848	0.152	0.390	0.610	264
8/1-8/30	0.611	0.236	0.153	0.111	0.500	0.389	72	0.383	0.436	0.128	0.053	0.819	0.181	0.298	0.702	94
9/1-9/30	0.702	0.155	0.143	0.131	0.511	0.357	84	0.377	0.481	0.104	0.038	0.877	0.123	0.434	0.566	106
10/1-10/23	0.538	0.231	0.231	0.000	0.539	0.461	13	0.438	0.500	0.062	0.000	0.688	0.312	0.438	0.562	16
10/24-11/17	0.542	0.083	0.375	0.125	0.458	0.417	24	0.200	0.500	0.267	0.033	0.867	0.133	0.400	0.600	30
	$x^2 = 55.53^{****}$			$x^2 = 28.51^{+}$				$x^2 = 26.40^{ns}$				$x^2 = 10.12^{ns}$		$x^2 = 7.45^{ns}$		
						Total n^x =	925									Total n^a = 1146

$^{+}$ - 0.1 < P < 0.05, **** - P < 0.0001, ^{ns} - not significant

X chromosome gene arrangement frequencies differed among the two samples, but the autosomal frequencies were remarkably homogeneous (Table 1). Throughout one year, Fall 1987 through Fall 1988, only X chromosome gene arrangement frequencies changed, particularly those on the left arm (Table 2; Fig. 1). Gene arrangement XL-2 showed the strongest seasonal shift, decreasing in frequency during the summer. The frequency of XL-2 dropped in October, 1987, but increased throughout Fall 1988. The Fayetteville population and the closest Ozark population, Steelville, Missouri, studied by Carson (1958) shared all gene arrangements but the frequency differences were quite large.

Repeated observations of such seasonal patterns will be necessary before any firm conclusions concerning selectively caused variation can be made. Certainly, the summer of 1988 was an extreme year characterized by drought and above average temperatures. Consideration of linkage with gene arrangements on opposite chromosome arms will also be necessary because linkage disequilibrium can be quite strong in natural populations of *D. robusta* (Levitan, 1973).

References: Carson, H.L., 1958, Adv. Genet. 9:1-40; Carson, H.L. and H.D. Stalker, 1949, Evolution 3:322-329; Dobzhansky, Th., 1948, Genetics 33:158-176; Etges, W.J., 1984, Evolution 38:675-688; Levitan, M. 1973, Evolution 27:215-225.

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Segregation of centric Y-autosome translocations in *Drosophila melanogaster*.

In an attempt to identify autosomal disjunction determinants in *Drosophila* males and females we screened for translocations between a doubly marked Y-chromosome (B^sYy^+) and the centric sections of chromosome 2 (Falk, R., S. Baker and A. Rahat, 1985a. *Genet. Res. 45*, 51-79. Falk, R., A. Rahat and S. Baker, 1985b. *Genet. Res. 45*, 81-93). Fifteen Experimental Stocks (ES's), each with a different half-translocation element (T-element) and three "identical" additional elements (A - a CyO, *pr* cn^2 autosome; F - a F(2L), *dp* or F(2R)VH2, *bw* free chromosome; X - a $Y^SX.Y^L$, In(1)EN,*y B* or a C(1)RM, y^2 *su*(w^a) w^a sex chromosome), were tested with four tester stocks for all eight possible segregation patterns. Segregation patterns in males were different from those in females. In males T-elements either carried or were devoid of sex-chromosome disjunction determinants. Disjunction of the T-A elements in males varied from nearly complete dependence to complete independence, indicating differences in autosomal disjunction determinants on the T-elements. In females no meaningful differences in segregation patterns were detected. All showed a preference for the three 2:2 segregation patterns.

In order to further elucidate the presence of disjunction determinants and their possible organization two additional series of 3KR X-ray induced T-elements were recovered. Disjunction patterns of the ES's established from these T-elements in males and females were determined (series II & III. Series I was that described by Falk et al. 1985a & b).

The screening method of Falk et al. 1985a was improved, so that more putative T-elements could be recovered as ES's. B^sYy^+; *dp b cn bw* irradiated males were mated to 0/C(1), y^2 *su*(w^a) w^a; CyO, *pr* cn^2 females. Cy F1 daughters