

Paik, Y.K. and K.C. Sung. University of Hawaii, Honolulu. Inversion frequencies in *D. immigrans* populations from the Island of Kauai.

The data presented in this communication is a continuation of the work reported by Paik and Sung (1972) on the inversion frequency of the species from the two major islands of Hawaii. In January 1972, a collection was made on Kauai. Populations were sampled at two sites, i.e.,

Halemanu (at 3800') and Berry Flat Trail (at 4100') on Mt. Kokee. Another collection was conducted at the same test sites in February 1973. The samples of 1972 are referred to as KH-72j and KT-72j respectively; those of 1973 as KH-73f and KT-73f respectively.

The majority of our results were obtained by performing cytological studies on the F_1 larvae of the wild-caught females ("egg samples") with some results in Table 2 coming from the examination of the chromosomal constitution of the wild males ("male samples"). The smear preparations of salivary gland chromosomes were fully examined for the presence of both hetero- and homokaryotypes. Table 1 summarizes the data on the observed frequencies of inversion heterozygotes. The inversions designated as "A", "B" and "C" in the tables are identical to those used by Brncic (1955). From Table 1 we have compiled the separate frequencies of individuals which are heterozygous for a single inversion. These are shown in Table 2 together with the frequencies of separate gene-arrangements. The inversion frequency variations be-

Table 1. Frequency of inversion heterozygotes and mean inversion heterozygosity per larva, measured by the "egg sample" technique.

Collection	Larvae tested	Percent inversion heterozygotes						% homozygotes*	Mean/larva (S.E.)
		A	B	C	A+B	A+C	B+C		
KH-72j	53	5.7	11.3	13.2	-	-	1.9	67.9	0.34 ± 0.07
KT-72j	37	13.5	2.7	13.5	2.7	-	-	67.6	0.35 ± 0.09
KH-73f	201	7.4	3.5	20.0	-	1.0	0.5	67.7	0.34 ± 0.02
KT-73f	187	11.2	5.3	16.6	0.5	0.5	3.2	62.6	0.42 ± 0.04
Pooled	478	9.2	5.0	17.4	0.4	0.6	1.7	65.7	0.37 ± 0.02

* Indicates percentage frequency of individuals which are not heterozygous for inversion(s).

Table 2. Frequency of separate karyotypes and gene-arrangements.

Collection	N	Karyotype			Arrange-ment		Karyotype			Arrange-ment		Karyotype			Arrange-ment	
		A/A	A/+	+/+	A	+	B/B	B/+	+/+	B	+	C/C	C/+	+/+	C	+
KH-72j	88*	.02	.10	.88	.074	.926	.00	.14	.86	.068	.932	.00	.19	.81	.097	.903
KT-72j	45*	.00	.13	.87	.067	.933	.00	.09	.91	.044	.956	.00	.16	.84	.078	.922
KH-73f	201	.00	.08	.92	.042	.958	.00	.04	.96	.020	.980	.01	.21	.78	.112	.888
KT-73f	187	.00	.12	.88	.061	.939	.00	.09	.91	.045	.955	.02	.20	.78	.118	.882
Pooled	521	.004	.11	.89	.057	.943	.00	.08	.92	.039	.961	.01	.20	.79	.108	.892

N Indicates the number of flies tested.

* Includes "male samples".

tween the four samples in terms of both the heterokaryotypes and gene-arrangements was investigated. The chi-square tests based on the G statistic indicated no statistical significance between the four samples with one possible exception. In the between populations analysis for 1973, inversion B had a significance level of $P = 0.047$. It is interesting to note that in all Kauai samples the most frequent arrangements are the same, i.e., inversion C. A more detailed paper discussing the differences in the relative distribution of the inversion frequencies between the Hawaiian Islands is in preparation.

Acknowledgement: We express appreciation to Mr. W.W.M. Steiner for useful comments on the manuscript.

References: Brncic, D. 1955, J. Hered. 46:59-63; Paik, Y.K. and K.C. Sung 1972, DIS 48:115-116.