chromosome of *D. persimilis* did not reveal significant correlations between recombination rate and codon bias or intronic GC when all data points were examined.

Our results initially appear inconsistent with those reported by Stevison and Noor (2010) due to differences in the data sets used in each study. However, when we reanalyzed the data using their specified parameters—excluding 5 Mb upstream and downstream from the centromere and telomere and high recombination rates from the analysis—for *D. persimilis*, we observed the same significant correlation between recombination rate and codon bias and intronic GC (results not shown) that they reported. Clearly, excluding centromeric and telomeric genomic regions that undergo little crossing over affects the results of studies examining the correlation between recombination rate and codon bias.

Our study was limited by the scarcity of fine-scale recombination data available for analysis in these *Drosophila* species. Further analyses of fine-scale recombination rates at multiple chromosomes in more *Drosophila* species are necessary to develop a comprehensive picture of the association of recombination rate and codon bias in this genus.

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Drosophilids of Perumalai hills of Kodaikanal (Tamilnadu State, India).

Harini, B.P., and D.S.S. Pranesh. Department of Zoology, Drosophila Culture Laboratory, Bangalore University, Jnana Bharathi Campus, Bangalore 560 056, India, Karnataka.

Significant progress has been made in the field of taxonomy and systematics of the family Drosophilidae (Diptera) in India. The *Drosophila* species are observed in essentially any environment, from the sea level to considerable altitudes, and in temperate as well as in equatorial zones (Throckmorton, 1975). However, Lachaise (1979) suggests that these species are subject to restrictions as regards the habitats they live in. Many factors affect the ability of a species to survive

and reproduce in sufficient numbers in order to persist in a locality. Biotic and abiotic factors may vary in space and time, and for a mobile organism spatial variation often becomes temporal variation (Futuyma, 1998). The belief that organisms are remarkably well suited to the world they live in predates scientific biology; metaphors used to explain the relation between organism and environment usually invoke an external world that has acquired its properties independently of the organism (Lewontin, 2000).

However, a vast area of great ecological interest still either awaits exploration or is poorly explored. Very little is known regarding Drosophilid fauna of Perumal alai peak of Kodaikanal, which is a highest peak at Kodaikanal in the Perumalmalai hills, that are a part of the greater Western Ghat mountain range in Tamil Nadu, India, having an elevation of 2,440 metres (8,005 ft). Meadows and grasslands cover the hillsides. Gigantic Eucalyptus trees and shola forests flourish in the valleys. Kodaikanal has the richest repositories of biodiversity in the world (Dwivedi *et al*., 1979, 1980; Singh and Gupta, 1977; Reddy and Krishnamurthy, 1971).

Table 1. Distribution pattern of different species of *Drosophila* at three different seasons of the year (2010) of Perumalai hills of Kodaikanal, Tamilnadu, India.

Months	Seasons		
	Summer (April)	Rainy (August)	Winter (December)
Temperature (° C)	18° C -22° C	16° C – 20° C	8° C - 11° C
*D. melanogaster*****	**73**	**71**	**44**
D. annanassae	22	21	04
D. bipectinata	39	12	09
D. biarempis	27	13	02
*D. simulans***	**58**	**44**	**22**
D. kikkawai	10	08	03
D. malerkotliana	12	10	00
*D. immigrans****	**61**	**59**	**47**
D. jambulina	02	00	00
D. nigra	16	11	00
D. s. neonasuta	23	17	09
*D. nasuta**	**34**	**39**	**09**
D. rajashekari	12	03	00
D. takahashii	04	00	00
TOTAL	393	308	149

*indicates the order of wide distribution in number.

A preliminary survey on Drosophilids of Perumalai hills has been made as no information is available about this particular peak of Kodai so far. It is situated at latitude 10° 14' 0" N / 77° 29' 0" E'. Perumalai hill has a sub-tropical climate. During summers (March to May) the average temperature ranges between 11°C to 20°C. Winters are very cool with maximum temperature of about 17°C and minimum touches about 8°C. During January, ice formations are seen at night and temperature can drop down to freezing level. The hills station has an average rainfall during monsoons (June to September). Collections were made using fermenting fruits as baits in three different seasons of the year (2010), *i.e* in summer (April), winter (December), and rainy seasons (August). Altogether 15 different *Drosophila* species were collected (Table 1). Total number of flies collected was 850. Maximum number of flies was collected in summer (46.23%) and least in winter (17.32%), and in rainy the percent of flies collected was 36.23%. With decreased temperature many species of the present study have diminished in number. It indicates that temperature is certainly a bias for the *Drosophilids* to survive in nature. The species diversity is increased in dry season rather than the wet condition. Out of fifteen species found, four species, namely, *Drosophila melanogaster*, *D. immigrans*, *D. simulan*, and *D. nasuta* were found to be distributed widely more in number in all the seasons of the present study. It clearly states that these species can withstand the temperature tolerance compared to other species of the present study. Interestingly our results also

compares with similar observation with regard to *D. immigrans* distribution in Nilgiris and Kodaikanal ranges of South thrives well in a humid climate (Sreerama Reddy and Krishnamurthy, 1971) in addition to the other three species.

Thus, climatic variables, such as humidity and rainfall, are determining factors in the occurrence of drosophilid species (Pavan, 1959). Therefore, the composition and structure of a drosophilid assemblage depends on the habitat in which it was established. The recognition of patterns of distribution leads to organizational levels about the ecology and evolution.

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A duplication at the tip of left arm of the second chromosome carrying alpha inversion in *Drosophila ananassae.*

Singh, S.S., P. Banerjee, P. Nanda, and B.N. Singh*. Genetics Laboratory, Department of Zoology, Banaras Hindu University, Varanasi-221005, India. * E-mail: bnsingh@bhu.ac.in

Chromosomal polymorphism is common in *Drosophila* (Da Cunha, 1960; Dobzhansky, 1970; Sperlich and Pfriem, 1986). *Drosophila ananassae* is a cosmopolitan and domestic species. It exhibits a high degree of chromosomal polymorphism (Singh, 1998a,b). *D. ananassae* in particular is known to carry 78 paracentric inversions, 21 pericentric inversions, and 48 translocations (Singh and Singh, 2007). However, only three paracentric inversions, namely, alpha (AL) in 2L, delta (DE) in 3L, and eta (ET) in 3R, are very common and have been called cosmopolitan inversions. The chromosomal polymorphism has been studied extensively in a large number of natural and laboratory populations of *D. ananassae* (Singh, 1996, 1998b; Singh and Singh, 2008).

Table 1. Observed and expected numbers of different karyotypes in laboratory population (Ranchi) of *D. ananassae.*

	Karyotypes											
	2L			X^2	3L			X^2	3R			X^2
	ST/ST	ST/AL	AL/AL		ST/ST	ST/DE	DE/DE		ST/ST	ST/ET	ET/ET	
Obs	0	28	72	2.65	41	53	6	4.3254*	57	39	4	0.7166
Exp	1.96	24.08	73.96		45.56	43.87	10.56		58.52	35.95	5.52	

df =1, *P<0.05