numbers of flies and species in the caught compared to other genera. The subgenus *Dorsilopha* is least in the number and as well as species. *D. nasuta* and *D. malerkotilana* species are the common species found in the hill and all the altitudes. So this is regarded as the common and abundant species in the hill. Another most important finding is all species were not found in all altitudes, and *D. nasuta, D. neonasuta, D. malerkotliana, D. rajasekari, D. jambulina,* and *D. bipectinata* were common species found in all altitudes. There are some species such as *D. coonorensis, D. suzuki, D. immigrans* found only in one or two altitudes. The community and biodiversity was big in higher altitude compared to lower altitudes. These results are entirely reverse to our own studies in Chamundi hill during 2007 (Guru Prasad and Hegde, 2006). These results were due to micro and macro climatic conditions, which are different from the location to other locations. The highest number and species of flies were found in 800m altitude with numbers. Further our intention is not only to study the taxonomy of *Drosophila,* but also the biodiversity using the index called Berger-Parker. The result of the Berger-Parker index according to the altitude was depicted in Table 1, where it shows the lower number in higher altitude (800m).

According to Ludwig and Reynold (1988), the greater the value of 1/d, the lower is the diversity. Application of these indices to the collection data of different altitudes of hill demonstrates that higher altitude of 800 m with lower value of 1/d has higher biodiversity than other altitudes (Table 1). This may be more easily understood if we observe the quantity and dominance of each species in each altitude, since the index combines two functions: number of species and uniformity, *i.e*., the number of individuals present in each species (Ludwig and Reynold, 1988; Torres and Ravazzi, 2006). Thus, from the present eco-distributional and population analysis of *Drosophila* in hill, it is clear that the distributional pattern of a species or related group of species is uneven in space and time. *D. malerkotliana* and *D. nasuta* emerged as champion species, as they are registered in all altitudes. *D. immigrans* is completely absent in the lower altitudes. In a nutshell, it can be said that the *Drosophila* community of hill is highly diverse and depends on several environmental factors like flora, which provides the habitat for flies in addition to the genetic structure of the species present in it.

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Analysis of inversion polymorphism and new inversion recorded in *Drosophila polymorpha* in the South of Florianopolis, Santa Catarina, Brazil.

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Drosophila polymorpha, described by Dobzhansky and Pavan (1943), belongs to the *cardini* group within the genus *Drosophila*. Species of this group inhabit different areas of Neotropical America. In Brazil, *D. polymorpha* has reports of a wider distribution in the Southeast (Da Cunha *et al.*, 1953), while in the south of the island of Santa Catarina, taxonomic studies of *Drosophila* communities consider this to be one of the species most often found (De Toni and Hoffmann, 1994).

Studies involving chromosomal inversions in the group *cardini* point to *D. polymorpha* as showing the highest number of polymorphisms of the group, both in relation to pigmentation and chromosomal inversions (Da Cunha *et al*., 1953; Rohde and Valente, 1996a; De Toni *et al.* 2001a). These inversion polymorphisms are one of the most studied systems in population genetics. Paracentric inversions are a common form of this polymorphism, restricted to chromosomal arms. This does not include centromeric regions, which are commonly observed in *Drosophila* (Ananina *et al*., 2004). To analyze these inversions, the banding pattern present in polytene chromosomes, illustrated in a reference photomaps, allows one to identify the breakpoints (De Toni, 2001).

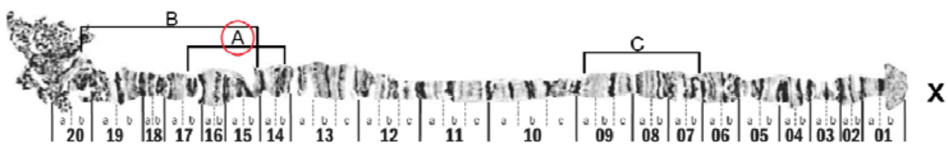

Figure 1. Indication in red represents the break points (14 b distal, 17 b proximal) XA, present in *D. polymorpha* isoline *1*.

Figure 2. *Polytene chromosomes* hybridized. The arrow points to the paracentric inversion XA in heterozygous state found in the sample of *D. polymorpha 1*.

Heed and Krishnamurthy (1959) developed genetic studies on the *cardini* group of island populations of the West Indies. Heed and Russell (1971) also contributed to studies of chromosomal inversion polymorphisms of the group, observing a high proportion of fixed inversions in the chromosomes of *D. polymorpha*. Further study of chromosomal polymorphism in this species was made by De Toni *et al.* (2001) in mainland and island communities in southern Brazil, in which seven different inversions were found in the communities of Santa Catarina, (six of them found and described for the first time).

Continuing with this study, we collected samples from populations of *Drosophila* in the south of the island, in an island region called Caiera da Barra Sul (S 27° 48'S; The 48° 33'), of Florianópolis, Santa Catarina, an area with formation of secondary Atlantic Forest in advanced stages of regeneration.

Samples of populations of *Drosophila* were obtained as adults flying around rooting fruit and banana baits left for at least three days in the area of collection.

The taxonomic identification of species, maintenance of collected samples, production of isofemale lines, cytological preparation, and cytogenetic analysis were all performed at the *Drosophila* Laboratory at the Federal University of Santa Catarina, Brazil.

Even though few strains have been analyzed so far, there has been a fairly high number of inversions. Out of the six strains analyzed, two inversions occurred, one of which was undescribed before now.

According to the photomap of the polytene chromosomes of this species, proposed by Rohde and Valente (1996) modified by Cordeiro and De Toni (unpublished data), the inversion detected in isoline named as *D. polymorpha 1,* corresponds to an inversion X (Figure 1), since it has the same breakpoints described by De Toni *et al.* (2001).

The strain called *D. polymorpha 2* shows a new paracentric inversion in the arm of chromosome IIR, now named IIRE, with break points set in the sessions 50a distal and 48c proximal (Figure 3).

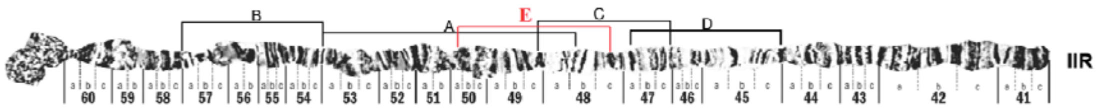

Figure 3. Indication in red represents a new inversion, IIRE found in *D. polymorpha* isoline *2.*

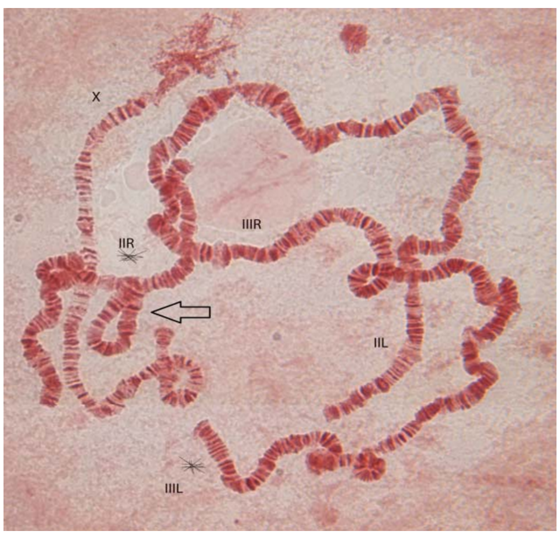

Figure 4. Polytene chromosomes hybridized. The arrow points to the new paracentric inversion IIRE in heterozygous state found in the sample of *D. polymorpha* isoline *2.*

The study of chromosomal inversions through the polytene chromosomes in *Drosophila* allowed us to assess evolutionary aspects of the genus, for example, the numerous chromosomal rearrangements as inversions of segments, which were fixed in each species (Wasserman, 1986).

As can be seen in the references (Dobzhansky, 1943; Tiniakov and Dubinin, 1945; Dobzhansky and Levene, 1948, 1951), the nature of chromosomal polymorphism in flies, especially in *Drosophila*, is clearly adaptive and balanced.

Thus, according to Da Cunha *et al.* (1950, 1959) and Da Cunha and Dobzhansky (1954), the amount of polymorphism present in a species is related to the variety of ecological niches they occupy by their species.

The hypothesis presented in this paper largely meets the data available in literature, which possibly explains the polymorphisms of this species, even with only such a low sampling in the area.

The results presented in this paper will contribute to future analysis in greater detail of the evolution of the *D. cardini* group.

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Radio-protective effect of piperine on reproductive organs of *Drosophila* model by induction of electron beam radiation.

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Introduction

Piperine is a major pungent substance and active component of black pepper (*Piper nigrum* Linn.) and long pepper (*Piper longum* Linn.). Both plants are used worldwide as household spices and condiments. They are also used as important ingredients in folklore medicine in many Asian countries. Piperine significantly enhances the absorption rate of nutrients such as Beta-Carotene, Vitamin B6, and Selenium. Selenium and Vitamin B6 levels increased from 30% to 40% percent, while Beta-Carotene increased by sixty (60%) percent. Study on piperine influence on chromosomes in rat bone marrow cells was analyzed in which male Wistar rats were orally administered piperine, then treated with cyclophosphamide by intraperitoneal injection. The results of chromosomal analysis demonstrated that piperine, at a dose of 100 mg/kg body weight, gave a statistically significant reduction in cyclophosphamide-induced chromosomal aberrations, thus indicating that piperine can have antimutagenic potential. Aqueous ethanolic extracts obtained from *Piper* species showed potent inhibitory activity for testosterone 5α-reductase. Piperine also showed *in vivo* anti-androgenic activity. It is suggested that piperine inhibits lipid droplet accumulation in mouse macrophages and especially inhibited cholesteryl ester (CE) synthesis. Studies on curcumin administered rats showed markedly elevated activity of the antioxidant enzymes malondialdehyde (MDA), catalase, and glutathione S-transferase (GST) in the cerebrum and cerebellum of epileptic rats due to PTZ-induced oxidative stress. Piperine (20 mg/kg orally) administered along with curcumin enhanced the bioavailability of the latter up to 20-fold more. Administration of piperine inhibited lipopolysaccharide (LPS), induced endotoxin shock, leukocyte accumulation and the production of tumor necrosis factor-alpha. Black pepper and its constituents like hot pepper, exhibit anti-inflammatory, antioxidant, and anticancer activities which are showed by using proinflammatory transcription factor NF-kappaB, COX -1 and -2 enzymes, human tumor cell proliferation, and lipid peroxidation (LPO) studies. Piperine, the compound of black pepper, can cause a significant decrease of blood pressure in normotensive rats possibly via calcium channel blockade, a pathway that is known to be effective in prevention of L-NAME (N (G)-nitro-L-arginine) methyl ester induced hypertension.

Black pepper, *Piper nigrum* L. (Piperaceae), has insecticidal properties and could potentially be utilized as an alternative to synthetic insecticides. Treatment of *D. melanogaster* with *P. nigrum*