(Hauser *et al.*, 2009; Hauser, 2011) and Europe (Calabria *et al.*, 2012). In the Neotropical Region, there is a report that P. O'Grady had collected *D. suzukii* in Costa Rica and Ecuador in the late 1990s (Calabria *et al.*, 2012). More recently, Deprá *et al.* (2014) recorded this new invader in areas of subtropical Atlantic Rainforest in states of Santa Catarina and Rio Grande do Sul, southern Brazil. Vilela and Mori (2014) found it in blueberries produced in São Joaquim, state of Santa Catarina, that were bought at a São Paulo city grocery store. These authors point out that despite being a cold-adapted species, after having arrived to the southeastern state of São Paulo, this invasive fly will probably expand its territory to other Brazilian states and South American countries.

The present report concerns the first finding of *Drosophila suzukii* in the tropical Atlantic Rainforest. Collections were performed between 12th and 20th of November 2014 in the *Parque Nacional da Serra dos Órgãos* (PARNASO), Petrópolis, state of Rio de Janeiro, southeastern Brazil. The collection localities have about 800 m altitude with tropical highland climates. During November 2014, the average temperature in this region was 18.9°C, with minimum of 14.8°C and maximum of 23.0°C (Climate-data 2014). Our sampling effort consisted in ten transects (A-J) of about 300 m: A- 22° 30' 16.8''S, 43°07'09.7''W; B- 22° 30' 20.0''S, 43°06'47.5''W; C- 22° 30' 31.6''S, 43°06'23.8''W; D- 22° 29' 42.2''S, 43°07'27.4''W; E- 22° 29' 38.8''S, 43°07'04.6''W; F- 22° 29' 20.5''S, 43°07'27.8''W; G- 22° 29' 07.5''S, 43°07'15.0''W; H- 22° 27' 36.2''S, 43°05'37.0''W; I- 22° 27' 49.6''S, 43°05'18.2''W; J- 22° 27' 57.1''S, 43°04'55.6''W. Except for transects named H and I, the localities surveyed in this study are areas of Atlantic Rainforest in good state of conservation. For each transect, five banana-baited traps were placed spaced 50-60 m apart. In transect "J", in a total of 299 flies, two males and one female of *D. suzukii* were collected. Although we have made similar effort to collect flies in all localities, no other specimen of *D. suzukii* was obtained. Species identification was based on external morphology and on the terminalia of both sexes (Bock and Wheeler, 1972; Vilela and Mori, 2014). An isofemale line was obtained from the wild collected female. Then, wild flies were preserved in a solution of 6 ethanol: 4 water: 1 acid acetic: 1 glycerin for further DNA analysis.

Most previous reports indicate the presence of *D. suzukii* in temperate and subtropical regions. Here we register the presence of this species in a tropical region, showing its high potential of spread and reinforcing the importance of monitoring this species for the knowledge of its colonization process in the Neotropics.

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Oxidative stress and longevity: Evidence from a long-lived strain of *Drosophila melanogaster.*

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Oxidative stress is one of the inescapable outcomes of the cellular processes. Reactive oxygen species (ROS) is one such contributor to the oxidative stress. Oxidative stress is implicated in aging and neurodegenerative disorders. Free radical theory of aging also supports the concept that ROS inflicts damage to the system (Harman, 1956). Although aging is a multifactorial process, oxidative stress remains an important factor. *Drosophila melanogaster* is often used as a model for understanding the role of oxidative stress in aging. Extensive selection experiments, transgenic variants, and antioxidant enzyme studies in *Drosophila* have been made to explore the relationship between oxidative stress and longevity (Arking, 2005).

Our study was aimed at understanding the relationship between longevity, oxidative stress, and antioxidant enzymes in *D. melanogaster* using ethanol as the inducer of oxidative stress. Similarities in behavior between flies and humans when exposed to alcohol are noteworthy. Although inebriation in humans is a complex process, understanding the simple behavioral and genetic aspects of intoxication in flies would help us to deduce the mechanisms and consequences. Innumerable studies have been carried out on consumption of alcohol, preference for alcohol, sensitivity to alcohol, sedation effects of alcohol, and effects of alcohol on locomotion (Moore *et al.*, 1998; Rothenfluh and Heberlein, 2002; Jahromi *et al.*, 2014).

Two strains of *D. melanogaster*, normal lifespan strain (NLS) that lives approximately for 60 days and long lifespan strain (LLS) that lives approximately for more than 100 days, were employed for the present study. These lines were isolated from *D. melanogaster* (Oregon K strain) flies that were obtained from the Drosophila Stock Center, University of Mysore, Manasagangotri, Mysore. These fly stocks were maintained in a vivarium at 22±1°C on standard wheat cream agar medium with 12:12 light and dark cycles. Synchronized eggs were collected (Delcour, 1969) and were raised under uniform conditions of temperature, humidity, food medium, and density. The flies obtained from these cultures were used for the experiments. In the current study, effects of ethanol-induced oxidative stress in NLS and LLS in relation to longevity were investigated.

Both NLS and LLS flies were exposed to different concentrations of ethanol for 24 h using 5% sucrose as a medium (Montooth *et al*., 2006). Assays were performed separately for males and females of both NLS and LLS. Using dose-response curve, the LC_{50} was calculated. Oxidative stress resistance assay was performed to decipher the sensitivity and resistance between the two strains. The LC_{50} dose of ethanol was used for the assays to induce stress in NLS and LLS flies.

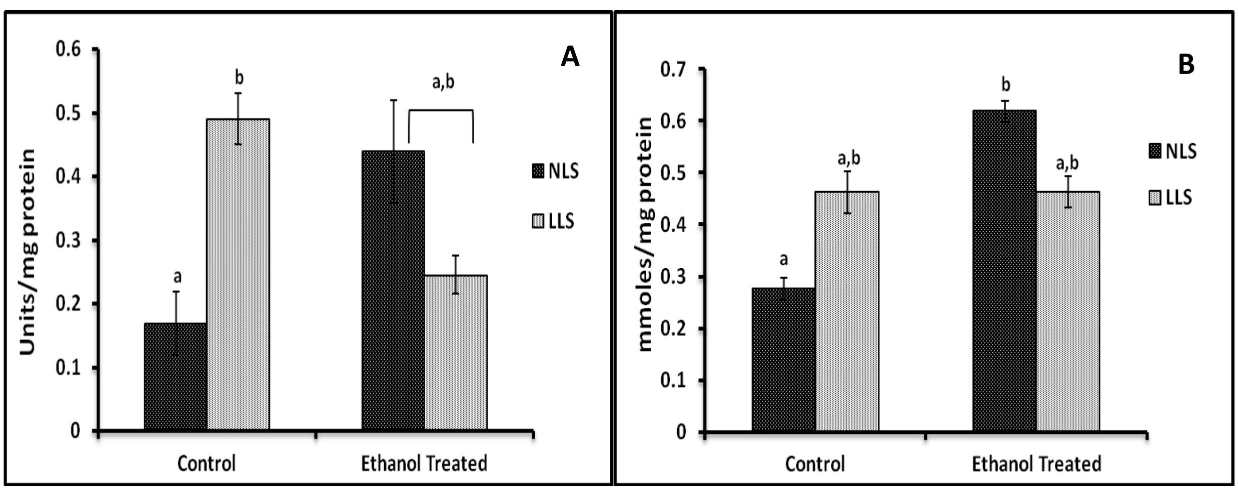

Figure 1. Enzyme activities in control and ethanol treated normal lifespan strain (NLS) and long lifespan strain (LLS) *D. melanogaster* males. Each value represents the Mean±SE. Bars with different alphabets above them differ significantly at $P < 0.05$. A, Superoxide dismutase activity; B, Catalase activity.

Negative geotaxis assay was carried out to evaluate the effect on the locomotory behavior (Feany and Bender, 2000). Altered locomotion of flies exposed to ethanol was similar to humans (Moore *et al.*, 1998). For superoxide dismutase assay, pyrogallol auto-oxidation method (Marklund and Marklund, 1974) and for catalase assay the procedure of Aebi (1984) was followed. Glutathione in the deproteinized supernatant was estimated by Ellman's reagent with a standard curve (Ellman, 1959). Acetylcholinesterase activity was determined by following the Ellman method (Ellman *et al.*, 1961). Alcohol dehydrogenase activity was measured following the method of Vallee and Hoch (1955). Induction of ROS was measured using 2',7'-dichlorofluorescein diacetate (Driver *et al.*, 2000).

Our results are consistent with those of Arking *et al.* (2000) and Arking (2005), who have reported positive correlation between oxidative stress resistance and antioxidant enzyme activities in long-living strains of *Drosophila*. However, we have noted higher alcohol-induced tolerance in LLS which positively correlates with antioxidant enzyme activities when compared with NLS of *D. melanogaster.* Figures 1A and B show superoxide dismutase and catalase activities in control and ethanol-treated NLS and LLS male flies, respectively. LLS flies showed higher antioxidant enzyme activities when compared to NLS flies.

Our study demonstrates that LLS flies have higher resistance to ethanol-induced oxidative stress when compared with NLS. Similarly, LLS flies show higher resistance to ethanol-induced locomotory behavior than NLS flies. In addition, the present study also revealed that aging affects the resistance to ethanol-induced oxidative stress in both NLS and LLS flies. This is the first report showing the relationship between ethanol-induced oxidative stress and longevity.

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Decalepis hamiltonii root extract protects against Gamma radiation toxicity in *Drosophila melanogaster.*

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Radiation therapy is widely used as theraputic option for cancer treatement (Mackillop *et al.*, 1997). Despite its therapeutic benefit, radiation is toxic and induces oxidative stress through generation of free radicals (Katz *et al*., 1996; Kaur *et al.*, 2000).

The fruit fly, *Drosophila melanogaster* is widely used as an experimental model in biological research as it shares many genes that are orthologous to humans (Mahtab *et al.*, 2007). Further, the age-related functional decline in flies is widely similar in other animals including humans (Grotewiel *et al.*, 2005). *Drosophila* is often used as a model organism in aging research.

For various therapies, the herbal preparations are often preferred as an alternative to the synthetic drugs in view of their safety. Phytochemicals, with free radical scavenging, antioxidant properties, and immune stimulatory effects have been evaluated for their radioprotective effects. Preclinical studies in the past