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

two decades have shown that many medicinal plants and their phytochemicals possess radioprotective potential (Ahlersova *et al.*, 1998).

The tuberous roots of *Decalepis hamiltonii* (Wight and Arn.) (Family: Asclepiadaceae) are consumed in southern India as pickles and juice in view of their health promoting properties. The roots are also used in folk medicine and ayurvedic preparations as a general vitalizer and blood purifier (Nayar *et al.*,1978). The root extract of *D. hamiltonii* (*Dh*) is a potent cocktail of novel antioxidants and have hepatoprotective and neuroprotective potential (Srivastava *et al.*, 2006; Srivastava and Shivanandappa, 2006, 2010a, b).

Present study was undertaken to determine the possible radioprotective role of *Dh* root extract against gamma radiation toxicity in *D. melanogaster* (Oregon K).

The fly stock was obtained from the Drosophila Stock Center, Department of Studies in Zoology, University of Mysore, Mysore. Experimental stocks comprising 5 day old flies were built up by the serial transfer method, and these flies were maintained on standard wheat cream agar medium at 22 ± 1°C and 70–80% relative humidity in a vivarium.

The adults were fed with a diet containing 0.5%, 1% *Dh* and the control flies were fed with diet without *Dh* root extract. By confining the flies in polypropylene tubes (65 × 25 mm), they were irradiated with gamma rays at 100 Gy, 200 Gy, 400 Gy, 600 Gy, 800 Gy, 1000 Gy, 1200 Gy, and 1400 Gy (Cobalt-60 Gamma radiation, Gamma chamber 5000) 3 times with a gap of 3 hr at a source strength of 14,000 Ci (Curie) that delivers about 9 kGy/hr (kilo Grey per hour).

After exposure to the radiation, the flies were transferred to fresh media bottles and the number of dead flies in each dose was recorded at 24 hr. Based on dose-response data, the median lethal dose (LD_{50}), that causes 50% mortality in 24 hr, was determined. The LD_{50} was calculated by using probit analysis.

From Figure 1 it is evident that exposure of *D. melanogaster* to different doses of gamma radiation produced dose-dependant mortality. At 100 Gy there was no mortality beyond which mortality increased in a dose dependant manner. The LD_{50} for control, 0.5% *Dh*, and 1% *Dh* treated group was found to be 800 Gy, 848 Gy, and 1010 Gy, respectively.

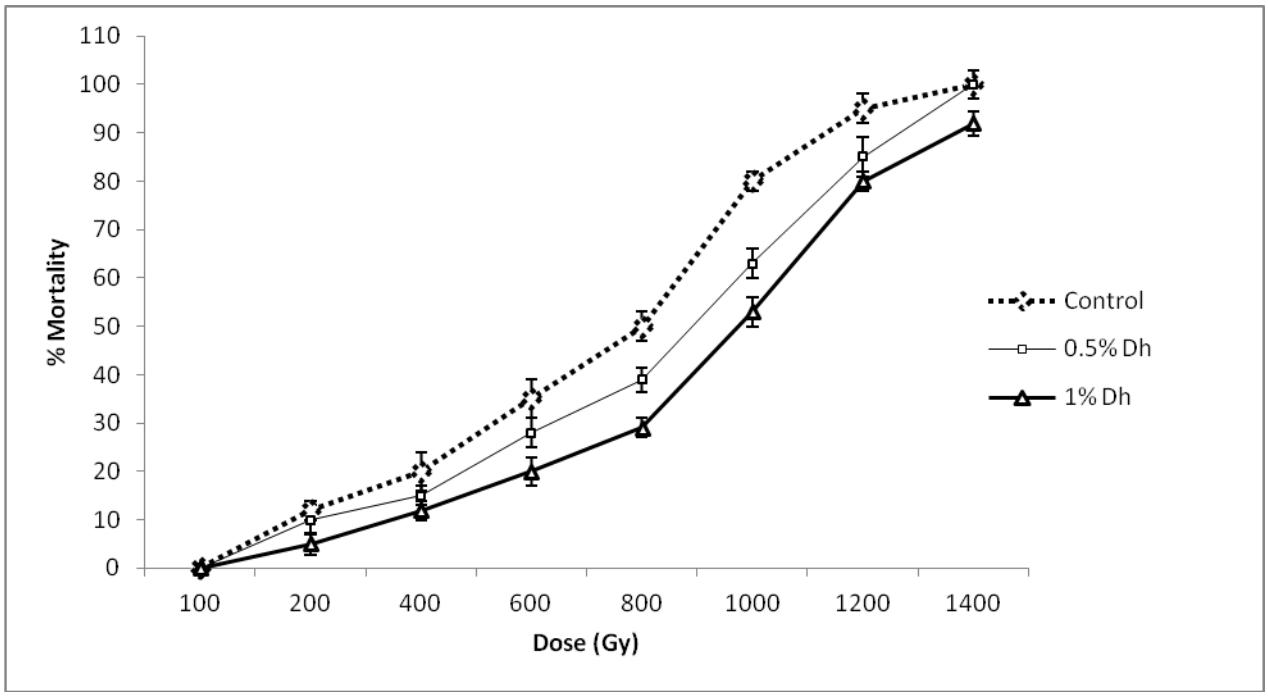

Figure 1. Gamma Radiation induced mortality in *D. melanogaster* in control, 0.5% *Dh*, and 1% *Dh* fed flies at different doses. Values given are Mean ± S.E (Each set contained 25 flies × 6 replicates).

Our results clearly show that *Dh* pretreatment protected *Drosophila* from gamma radiation induced lethality (Figure 1) and increased survivability of *Dh* fed *Drosophila* compared to control group. Therefore, *Dh* pretreated flies exhibit more radiation tolerance/resistance than the control flies. Our study demonstrates the radio protective potential of the edible roots of *Dh*, which has implications in cancer radiation therapy.

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A novel *GMR-Gal4* insertion produces a rough eye phenotype.

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Introduction

Much of modern research in *Drosophila* depends upon the use of the *UAS/Gal4* system (Brand and Perrimon, 1993) to express various transgenes under defined conditions. For the most part, it has been widely believed that the *Gal4* transgenes produce few negative effects in *Drosophila melanogaster*. However, *GMR-Gal4*^{12} was shown to produce an apoptosis-dependent "rough eye" phenotype (Kramer and Staveley, 2003) and the neural accumulation of the protein product of *Gal4* has been linked to neurodegeneration in *Drosophila* (Rezaval *et al.*, 2007). Apart from transcriptional interactions with the *UAS*-bearing transgenes, highly elevated levels of *Gal4* expression have been shown to lead to stress and immune responses (Liu and Lehmann, 2008). Due to the prominence of *Gal4* in *Drosophila* research, we believe that this phenomenon should be further examined.

GMR-Gal4^{12}, very commonly referred to as simply *GMR-Gal4*, was originally selected from a group of fifteen *GMR-Gal4* transgenic insertion lines (Freeman, 1996). Only two of these lines, including *GMR-Gal4*^{12}, did not display a hemizygous roughened eye phenotype at 25°C. Our group has shown, in *GMR-Gal4*^{12} homozygotes cultured at 25°C and *GMR-Gal4*^{12} hemizygotes raised at 29°C, that an apoptosis-dependent altered developmental process can produce a "rough eye" phenotype (Kramer and Staveley, 2003). To further investigate this phenomenon, we have produced a version of *GMR-Gal4* that we believe may be similar to the other original "rough eye" insertions to help evaluate the consequences of *Gal4* expression.

Materials and Methods

Drosophila media

Our standard cornmeal-yeast-molasses-agar medium is prepared with 65 g/L cornmeal, 10 g/L nutritional yeast, and 5.5 g/L agar in water, cooked by autoclave for 30 minutes (plus depressurization) then