

DNA Damage and Apoptosis Induced in *Drosophila melanogaster* Exposed to Different Duration of 2400 MHz Radio Frequency-Electromagnetic Fields Radiation

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Abstract : Over the last decade, the exponential growth of mobile communication has been accompanied by a parallel increase in density of electromagnetic fields (EMF). The continued expansion of mobile phone usage raises important questions as EMF, especially radio frequency (RF), have long been suspected of having biological effects. In the present experiments, we studied the effects of RF-EMF on cell death (apoptosis) and DNA damage of a well- tested biological model, *Drosophila melanogaster* exposed to 2400 MHz frequency for different time duration i.e. 2 hrs, 4 hrs, 6 hrs,8 hrs, 10 hrs, and 12 hrs each day for five continuous days in ambient temperature and humidity conditions inside an exposure chamber. The flies were grouped into control, sham-exposed, and exposed with 100 flies in each group. In this study, well-known techniques like Comet Assay and TUNEL (Terminal deoxynucleotide transferase dUTP Nick End Labeling) Assay were used to detect DNA damage and for apoptosis studies, respectively. Experiments results showed DNA damage in the brain cells of *Drosophila* which increases as the duration of exposure increases when observed under the observed when we compared results of control, sham-exposed, and exposed group which indicates that EMF radiation-induced stress in the organism that leads to DNA damage and cell death. The process of apoptosis and mutation follows similar pathway for all eukaryotic cells; therefore, studying apoptosis and genotoxicity in *Drosophila* makes similar relevance for human beings as well.

Keywords : cell death, apoptosis, Comet Assay, DNA damage, *Drosophila*, electromagnetic fields, EMF, radio frequency, RF, TUNEL assay

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