EFFECTS OF FOOD ADDITIVE MONOSODIUM GLUTAMATE ON LIFESPAN OF *Caenorhabditis elegans*

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Monosodium glutamate (MSG) is a widely used flavor enhancer and due to its increased use in the food industries, the individual consumption is steadily increasing worldwide. Recent studies showed that excess accumulation of MSG is harmful for human health. The main objective of this study was to evaluate the effect of MSG on lifespan using *Caenorhabditis elegans* as the model organism. Wild type (N2) and insulin receptor mutant *daf-2* (CB1370) strains of *C. elegans* obtained from *Caenorhabditis* Genetic Centre at the University of Minnesota. Seeded Nematode Growth Medium (NGM) plates were prepared with different concentrations of MSG (0.01mM, 0.05mM, 0.1mM, 1mM, 5mM, 10mM, 20mM and 24mM) and negative control. 0.05mM is equal to the average amount of MSG consumed by human per day. Twenty four L4 larvae were transferred from respective synchronous cultures of wild type and *daf-2* strains. The population was scored on daily basis until the whole population was dead. Worms failed to respond to repeated prodding on the head and tail were scored as dead. Experiment was done in triplicates. Final data were analyzed using OASIS (Online Application for Survival Analysis) and life span curves were generated. Here, N2 showed a mean life span reduction whereas, *daf-2* mean life span was increased comparatively but both results were not significantly different from their respective negative controls. Since previous studies suggest that MSG could have a negative impact on organisms, MSG concentration gradient was tested in wild type worms. The lower MSG concentration (0.05mM) significantly declined the mean life span of N2 by 13.77% ($P<0.05$). With increasing MSG concentration, the mean life span was further decreased by 16.83% significantly ($P<0.05$). Overall the present study suggests that food additive monosodium glutamate exerts a significant reduction of *C. elegans* lifespan probably via *daf-2* gene, implying an effect of insulin signaling pathway on lifespan.

Keywords: *Caenorhabditis elegans, Food additive, Life span, Monosodium Glutamate*

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