Investigating Daphnia magna Response to Sleep Aids as an Indirect Correlation With Humans

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The hearts of humans as well as Daphnia magna are striated and neurogenic. In humans, substances that induce sleep also lower blood pressure and heart rate. Research indicates that when D. magna is in a resting state, the heart rate decreases as well. Question: When exposed to common over-the-counter (OTC) sleep-aids, which one will decrease the heart rate of D. magna the most without increasing mortality after 40 minutes of exposure? Different percentage solutions were created from the following independent variables: Diphenhydramine with 10% alcohol, Diphenhydramine, Naproxen with diphenhydramine, Doxylamine succinate, Melatonin, Valerian root, Cabernet Sauvignon, Beer, Chamomile tea, Sleepytime tea, Sleepytime-extra tea, Lavender tea, Lavender-Chamomile tea. Heart rates of D. magna were calculated after exposure to each solution for 10 then 20 minutes, with mortality rates of D. magna assessed at 40 minutes. Hypothesis: When exposed to common OTC sleep-aids, the heart rate of D. magna exposed to Melatonin 5% solution will decrease the most after 20 minutes with no increase in mortality after 40 minutes. Results: D. magna exposed to Valerian Root 1% solution for 20 minutes achieved the lowest mean average heart rate of 130 with no increase in mortality after 40 minutes. The mean heart rate of the D. magna exposed to Valerian Root 5%, 1%, and 0.5% solutions combined results was 143 with no increase in mortality after 40 minutes as well. D. magna exposed to Melatonin 5%, 1%, and 0.5% solutions, mean average heart rate was 158 with no increase in mortality after 40 minutes.

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