Investigating the Potentially Lethal Effects of Kratom When Combined with Over the Counter Medications and Readily Available Household Products on Daphnia Heart Rate to Mimic the Dangers of Teen Drug Fabrication and Abuse

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In the United States we are currently facing a serious opioid drug abuse epidemic. According to research, 5,455 people (ages 15-24) died of drugs in 2017. Although these opioids are strictly regulated, people are still finding ways to obtain them. In addition to frequently abused opioids like Oxycontin and hydrocodone teenagers in particular are finding alternative ways to get high. Our youth are unaware that the concoctions they are creating such as nutmeg and anti-diarrheal pills in conjunction with alcohol is potentially more dangerous than some opioids. Though they are successfully emulating the response, they are unaware of the adverse effects on their cardiovascular systems, such as arrhythmia and tachycardia. Alcohol (C_2H_6O) and nutmeg (Myristica fragrans) are depressants commonly consumed by teens. Although potentially dangerous by themselves, when combined with stimulants they are significantly more unpredictable. An enticing new stimulant on the market is Kratom (Mitragyna speciosa), which is currently illegal in 6 states: Alabama, Arkansas, Indiana, Tennessee, Vermont, Wisconsin and the District of Columbia. The reason for this is that the unregulated plant causes mood enhancement similar to the opioids listed above and prescription painkillers with the same likelihood of addiction. The two alkaloids present in Kratom ($C_{23}H_{30}N_2O_4$) are Mitragynine and 7-Hydroxymitragynine. This experiment will analyze the synergistic effects of Kratom in conjunction with nutmeg, alcohol and anti-diarrheal pills on Daphnia magna heart rates to mimic the dangers of teen drug fabrication and abuse.