**RESEARCH QUESTION/PURPOSE**

**RESEARCH PURPOSE**
I want to research the effect that cocaine has on maggot growth and how that affects determination of the time of death of an organism.

**RESEARCH QUESTION**
What effect does cocaine have on maggot growth and how does that affect the use of maggots to determine time of death?

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**METHODODOLOGY**

This experiment is designed to examine the how cocaine affects the growth of maggots and how that affects determining time of death. A group of piglets will be injected with various amounts of cocaine corresponding to the lethal dosage based on their weight and one piglet will be left without any cocaine in its system. The cocaine will be in different concentrations corresponding to 25% cocaine, 50% cocaine, 75% cocaine and 100% cocaine. The piglets will then be euthanized and placed in a controlled environment and be allowed to decompose. Blowflies will then be introduced into the environment and be allowed to lay eggs on the corpses. The maggots will be reared on the pig corpses, but precautions will be taken as to make sure the maggots do not migrate across specimens. Throughout the experiment the growth of the maggots will be measured and charted. The information will then be compared to charts to figure out if their growth was affected. From there I will be able to determine if the time of death using the growth patterns of maggots will be affected.

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**LITERATURE REVIEW**

Within the field of forensic science, there is a constant need for new developments to help solve crimes. One of the newer developments is in the field of forensic entomology. Forensic entomology is the study of insects and how they can be used to help solve crimes. The application of insects in forensic science can be used to determine time of death or where death occurred. One important bug in determining time of death is the maggot. The maggot’s growth can help to pinpoint a time around which someone has died. Drugs, however, can affect the speed at which maggots develop. I would like to find out just how much cocaine speeds up the growth of maggots and how that affects determining the time of death of an individual.

An insect develops in a very predictable pattern, which makes using insects to predict the postmortem interval reasonably accurate. There are certain factors that can affect the growth and development of maggots making determining the postmortem interval more difficult. Flies can lay eggs on a corpse as early as 30 minutes after death. One such factor is drugs that have been introduced into the deceased’s system shortly before death. There have been studies that examine the effects of heroin in the body of a deceased person, and research indicates that it can affect the maggot growth so that the postmortem interval can be off by up to 29 hours (Byrd 381-385). Also, research has shown that cocaine also speeds up the growth of maggots. In one study maggots fed on rabbits with specific dosages of cocaine corresponding to 0.5, 1.0, and 2.0 times the lethal dosage by body weight (Byrd 331-338). The maggots that fed on the rabbit with no cocaine in its system and the rabbits with 5 the lethal dose of cocaine in their system developed at similar rates. The maggots that fed on the rabbits with 0.5 and 2.0 times the lethal dosage of cocaine in their system developed at more rapid rates. This knowledge was applied when a young woman was found in Washington and the maggots growth showed she had been dead for approximately 3 weeks. When all the other information was combined, it was shown to be impossible for her to have been dead for that length of time. It was observed that the maggot growth appeared to be accelerated due to the cocaine she had snorted shortly before her death (Resh 381-385).

While there has been some research done detailing how cocaine affects maggot growth, there are studies detailing how the amount in the postmortem interval can be affected. There are numbers for many other drugs such as heroine and methamphetamine that give exact measurements for how to adjust to postmortem interval, but none for cocaine. All in all, there are actually very few studies that detail the effects of cocaine on maggot growth.

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**HYPOTHESIS**

The maggots that will be raised on the piglets injected with the highest concentration of cocaine will develop at a more rapid rate than those raised on piglets with a lower concentration of cocaine. Since cocaine is a stimulant, it will speed up their growth. The rapid development will then affect how the time of death is determined by causing the time of death to appear to be less than it actually is because of the accelerated growth.

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**BIBLIOGRAPHY**


Images:
- http://www.scientificamerican.com/media/inline/blog/image/maggots.jpg

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