THE EFFECT LETHAL DOSAGE OF MORPHINE AND ARSINIC ON THE GROWTH OF LARVA CHRYSOMA.Sp RATE ON WHISTAR RAT IN MEDAN CITY

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Background: Lately, we often encounter many unnatural deaths, including: murder, rape, drug overdose, poisoning, or suicide. And sometimes unnatural deaths are largely undetected and only corpses are found left behind began to rot with many fly larvae all over their bodies. In this case the development of the fly's life cycle, which starts by laying eggs, then develops into larval instar I, II, III, prepupaee, pupae and become flies can be react with carcasses of rats that have been given morphine and arsenic.
Method: Observational research used 9 male Whistar rats aged 3-4 months with a weight of 200-300 grams divided by 3 (mice given morphine with lethal doses, arsenic given lethal doses and mice dislocated by cervical vertebrae). Before that flies were catch, there were 100 Chrysoma flies and they were put into 1 cage which was covered with gauze. Observation of death and recorded. then a 1 cm thin incision is made in the right abdomen and then it is placed in a cage filled with Chrysoma flies. The first observation is made after the sample is placed and recorded D0. Observations that are considered are changes in sample, egg or larvae of fly that inhabiting the sample.
Result: The development of the fly's life cycle in the administration of morphine and arsenic is faster than control. Eggs were faster found in the control than morphine and arsenic administration. Instar larvae are 3 times longer in morphine compared with arsenic and control but the Instar larvae cycle is 3 times faster.
Conclusion: Administered of morphine and arsenic is very influential on the development cycle of flies, growth in larval length is significantly higher. Administered of morphine and arsenic is very influential on the egg placement and the process of decaying rat carcasses longer.

Keywords: Time of Death, Larval Length

Introduction

Lately many unnatural deaths we often encounter, including: murder, rape, drug overdose, poisoning, or suicide. And sometimes unnatural deaths are largely undetected and found only left behind corpses that began to rot with many fly larvae all over his body[1].

Narcotics can accelerate or slow the growth of fly larvae and can disrupt the estimated time of death to 29 hours[1]. Chemicals that can accelerate or slow the growth of fly larvae include Triazolam, Oxazepam, Alimemazine, Chloripriamine, Phenobarbital, Malathion, Mercury, Amitriptyline, Nortriptyline, Cocaine, Phenycyclidine, Heroin, and Morphine[21].

Morphine is the most important opioid in the opium family which is found in more than 10 percent of opium[1]. In addition to its powerful analgesic properties, morphine also has an influence on other central nervous systems based on suppression, sedatives, hypnosis, euphoria, suppression of respiratory reflexes and coughing. Morphine effects that stimulate the central nervous system include: miosis, excitation and convulsions. In some long-term morphine users, found symptoms of dependence, both physical and psychological.

In corpses that have long been decaying, it is very difficult to determine the time of death[7]. So one of the deciding examination of corpses that have rot can be used organisms that multiply on the corpse. One of the insect organisms or animals that are attracted to the stench of corpses is the fly. In the world of forensics, various ways can be done to determine the time of death of the body, among others by determining the age of fly larvae found in the body, as is done in the world of Forensic Entomology[7]. The stench that attract flies were produced by bacterial and enzymatic reactions in dead tissue (Dahlan 2007).

The fly will lay its eggs in certain locations such as moist and protected, (mouth hole, nose, vagina, anal and open wound).[3] Not all flies put larvae eggs on the corpse, there is the development of flies by ovovivipar that is by hatching eggs in the body of the parent fly.

Research Purposes

General Purpose: To determine the effect of morphine and Arsenic lethal doses on rat carcasses from the growth of Chrysoma Sp larvae in Medan City.

Spesial Purpose: To determine the lethal dose effect of morphine and arsenic on rat carcasses with the length of fly larvae in Medan City.

To find out the lethal dose effect of morphine and arsenic on rat carcasses with duration of fly growth in Medan City.

Literature Review

Death is the final phase in every human life. Death can be seen from two dimensions, namely somatic death and molecular death. Somatic death is death which is assessed from the cessation of the system of circulation, respiration and innervation, if one of the systems stop then the other system stops. Molecular death occurs after somatic death. After the death, the body will experience changes, including a decrease in body temperature,

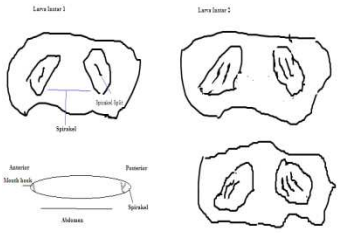
bruising of the body, stiffness, and decay[6,7].

The stench produced by the decaying process of the body can attract nearby insects to come and breed around or on the body[4]. There have been many studies that have concluded that insects are associated with an estimated length of time of death (Hall, 1990)[2]. The most studied insects are the flies of the family Calliphoridae, Sarcophagidae and Muscidae[2].

Determination of the time of death by entomology can use two methods. The first way is by utilizing the larval stage of the fly[8]. The stages of the larvae that are utilized are starting from the eggs of the instar larvae-I instar larvae-II instar larvae-III-prepupae-pupa-fly. Fly larvae will be found in moist and protected areas, such as the mouth, nose, anus and open wound.[3]. By utilizing the development time of larval stage as measured by larval length, an estimated time of death will be obtained. The second way is to pay attention to the type of adult fly around the corpse. By utilizing the behavior and arrival time of several different types of flies, it can be estimated the time of death[8]. However, both methods are greatly influenced by many factors such as the character of the type of fly, weather, climate (including temperature, light intensity and humidity), maggot mass temperature, geography, and drugs or toxins[4,5]. So that the determination of the types of flies or fly larvae found in the body can also estimate the location of death.

The life cycle of flies namely eggs, larvae, pupae and adults. Several types of larvae can be found on corpses that can be useful for forensic purposes [4,5].

- Egg flies vary in shape and size [5]. Flies usually lay their eggs in groups that can reach 40-200 eggs once laying eggs and with a size of 2mm[8]. Fly eggs will hatch into larvae after about 16-24 hours.
- Larvae don't have legs (legless larva/apodous).[5] Larvae will experience skin peeling three times before finally migrating to become a pupa.



Besides size, the characteristic that can distinguish instar larvae 1, 2 and 3 is the shape of the spiracles. In the first instar larvae spiracle (spiracle slit) is newly formed, in the 2nd instar larvae have two spiracle slits, and the third larvae have three spiracle slit[15].

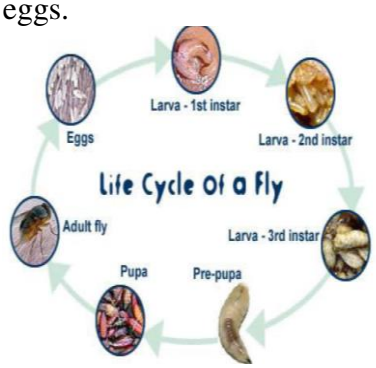
Instar Larvae I: This stadium usually requires the least amount of time among other stadiums. In most fly larvae it takes 11-38 hours to complete this stage since the eggs hatch, with peak growth at 22-28 hours. Larvae length at this stage reaches approximately 5 mm or the size of grains of rice.

Instar Larvae II: takes 11-22 hours to become instar larvae III. The larvae form a colony

called "maggot mass" and cause the temperature around the larvae to rise slightly, called the maggot mass temperature.[18] Larvae at this stage are approximately 10 mm and form posterior spiracles for respiration.

Instar Larvae III: This stadium is the longest stadium which is divided into two stages. The first stage the larvae continue to eat corpses for 20-96 hours, at this stage the larvae have four posterior spiracles and reach a length of approximately 17 mm. the second phase will last 80-112 hours. After the larvae stop eating, they will then move to a drier area to start the prepupaee stage. Larvae change color slightly reddish brown.

- Prepupae : It takes 1-2 days to become a pupa, with a size of 8-9mm.
- Pupae: it takes about 10 days in the puparium, for transformation from larvae to adult flies. The general size is approximately 12 mm. The pupa stage can survive in hot, cold or flood with conditions of the above size.
- Adult: After some time, the larvae that have changed into adult fly forms will come out of the pupae and can start their life cycle again by laying eggs.



Type of Research

This research is a descriptive observational study with a prospective research design. Variables are measured at the same time as the research takes place. This research is using primary data to determine the duration and length of fly larvae in whistar rat carcasses. This research was conducted at USU Hospital Forensic Installation.

Method

- Using 9 male Whistar rats aged 3-4 months with a weight of 200-300 grams divided by 3 (mice given morphine lethal doses, arsenic given lethal doses and rats that were dislocated neck bones).
- Previously caught as many as 100 flies Chrysoma flies and put in 1 cage covered with gauze.
- 3 mice were given morphine at lethal doses at a dose of 461mg/kg = 92.2 mg. Morphine is done by injecting the stomach with a dose of 100 mg recorded each treatment. And marked with black markers line one, put into 3 containers.
- 3 rats were given arsenic in lethal doses at a dose of 20 mg / kg = 4 mg. Arsenic is done with a mouth and mouth recorded every treatment. And marked with

black markers line two, placed in 3 containers.

- 3 rats were done by breaking the cervical vertebrae recorded for each treatment. Without the line put into 3 containers.
- The death is observed and recorded.
- After all die, then make a 1 cm thin incision in the right abdomen and then put into a cage that has been filled with Chrysoma flies.
- The first observation is made after the sample is placed and recorded D0.
- Observations that are considered are changes in sample, egg or fly larvae that inhabit the sample.
- If there are eggs or larvae already, the sample is transferred to a cage covered with wire nets without flies. Then record the time, the length of each change. After becoming a pupa, it is moved to a container and closed which has been perforated on it.

Table I. Time of Treatment

Method	Time Administered	Time of Death	Picture
Lethal dose morphin	29-10-2019 08.40 Western Indonesia Time	29-10-2019 10.20 Western Indonesia Time	
Lethal dose Arsenic	29-10-2019 08.50 Western Indonesia Time	29-10-2019 09.10 Western Indonesia Time	
Control	-	29-10-2019 10.25 Western Indonesia Time	

Table II Larvae Length Growth Every Day and Larvae Photo on Rat 1

(Cervical dislocated)

DAY	OBSERVATION	SIZE	PHOTO
D0	Clear white eggs were found at 17.00 Western Indonesia Time	0,6 mm	
D1	Clear white Instar Larvae-1 was found	3,1 mm	
D2	White Instar Larvae-2 actively moving	5,3 mm	
D3	Grayish Instar Larvae-3 was found	8,9 mm	
D4	White-brown Instar Larvae-3 was found	13,8 mm	
D5	Blackish Instar Larvae-3 was found not active	14,9 mm	
D6	Brownish prepuppae was found	13,5 mm	
D7	**Still same with D6**		
D8	Brown blackish pupae was found	7 mm	
D9	**Still same with D8**		
D10	**Still same with D9**		
D11	**Still same with D10**		
D12	Fly Crysoma Sp was found		

Table III Larvae Length Growth Every Day and Larvae Photo on Rat 2 (Cervical dislocated)

DAY	OBSERVATION	SIZE	PHOTO
D0	Eggs were found at 17.10 Western Indonesia Time	0,65 mm	
D1	Clear white Instar Larvae-1 was found	4 mm	
D2	White Instar Larvae-2 actively moving	5,8 mm	
D3	Grayish Instar Larvae-3 actively moving	7,0 mm	
D4	White blackish Instar Larvae-3 was found not active	15,2 mm	
D5	Blackish Instar Larvae-3 was found not active	14,9 mm	
D6	Brownish prepuppae was found	13,5 mm	
D7	Still same with H6		
D8	Brown blackish pupae was found	12 mm	
D9	Still same with H8		
D10	Still same with H9		
D11	Still same with H10		
D12	Fly Crysoma Sp was found		

Table IV Larvae Length Growth Every Day and Larvae Photo on Rat 2 (Cervical dislocated)

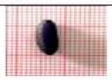
DAY	OBSERVATION	SIZE	PHOTO
H0	Clear white oval eggs were found at 17.20 Western Indonesia Time	0,7 mm	
H1	Clear white Instar Larvae-1 was found	3,8 mm	
H2	ClearWhite Instar Larvae-2 actively moving	5,5 mm	
H3	White Instar Larvae-2 actively moving	6,0 mm	
H4	White Instar Larvae-3 actively moving	16,3 mm	
D5	White brownish Instar Larvae-2 not active	15,3 mm	
D6	Brownish prepuppae was found	13,5 mm	
D7	Still same with D6		
D8	Brown blackish pupae was found	12,1 mm	
D9	Still same with D8		
D10	Still same with D9		
D11	Still same with D10		
D12	Fly Crysoma Sp was found		

Table V Fly Cycle Development on Whistar Rat Carcasses with Cervical Dislocation

No	Development		Lenght	Fly Cycle	Long Cycle	Mean
1	Egg	Rat 1	0,6mm	D0	1 Day	0,65mm
		Rat 2	0,65mm	D0	1 Day	1 Day
		Rat 3	0,7mm	D0	1 Day	
2	Instar Larvae 3	Rat 1	3,1 mm	D1	1 Day	3,6mm
		Rat 2	4mm	D1	1 Day	1 Day
		Rat 3	3,8mm	D0	1 Day	
3	Instar Larvae 3	Rat 1	5,3mm	D2	1 Day	5,6mm
		Rat 2	5,8mm	D2	1 Day	1 Day
		Rat 3	5,75mm	D2	2 Days	
4	Instar Larvae 3	Rat 1	12,5mm-	D3	3 Days	13,5mm
		Rat 2	12,3mm	D3	3 Days	3 Days
		Rat 3	15,8mm	D4	2 Days	
5	Prepuppae	Rat 1	13,5mm	D6	2 Days	13,5mm
		Rat 2	13,5mm	D6	2 Days	2 Days
		Rat 3	13,5mm	D6	2 Days	
6	Puppae	Rat 1	7mm	D8	4 Days	10,4mm
		Rat 2	12mm	D8	4 Days	4 Days
		Rat 3	12,1mm	D8	4 Days	
7	Fly	Rat 1	-	D12	-	-
		Rat 2	-	D12	-	
		Rat 3	-	D12	-	
8	Fly development					12 Days

Table VI Larvae Length Growth Every Day and Larvae Photo on Rat 4 (Lethal Dose Morphine)

DAY	OBSERVATION	SIZE	PHOTO
D0	There were no eggs	-	-
D1	Clear white egg was found	0,6mm	
D2	Clear Instar Larvae 1 was found	3,8 mm	
D3	White Instar Larvae 2 was actively moving	4,7 mm	
D4	White Instar Larvae 2 was actively moving	8,8 mm	
D5	White brownish Instar Larvae 3 was less actively moving	16,2 mm	
D6	Brown darkish prepupae was found	10 mm	
D7	Brownish pupae were found	12,3mm	
D8	**Still same with D7**		
D9	Fly Crysoma Sp was found		

Table VII Larvae Length Growth Every Day and Larvae Photo on Rat 5 (Lethal Dose Morphine)

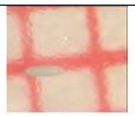
DAY	OBSERVATION	SIZE	PHOTO
D0	There were no eggs	-	-
D1	Clear white egg was found	0,5mm	
D2	Clea whiter Instar Larvae 1 was found	4 mm	
D3	Bright white Instar Larvae 2 was actively moving	6,2 mm	
D4	White brownish Instar Larvae 2 was actively moving	9,9 mm	
D5	White brownish Instar Larvae 3 was actively moving	18,2 mm	
D6	Brown darkish prepupae was found	11 mm	
D7	Brownish pupae were found	12,2mm	
D8	**Still same with D7**		
D9	**Still same with D8**		
D10	Fly Crysoma Sp was found		

Table VIII Larvae Length Growth Every Day and Larvae Photo on Rat 6 (Lethal Dose Morphine)

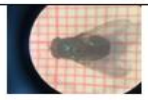
DAY	OBSERVATION	SIZE	PHOTO
D0	There were no eggs	-	-
D1	Clear whiter Instar Larvae 1 was found	4,2mm	
D2	White Instar Larvae 2 was actively moving	5,5mm	
D3	White Instar Larvae 3 was actively moving	9,3 mm	
D4	White brownish Instar Larvae 3 was actively moving	16,2 mm	
D5	White brownish Instar Larvae 3 was actively moving	16,8 mm	
D6	Brown darkish prepupae was found	11 mm	
D7	Brownish pupae were found	7.5mm	
D8	**Still same with D7**		
D9	**Still same with D8**		
D10	Fly Crysoma Sp was found		

Table IX Fly Cycle Development on Whistar Rat Carcasses with Lethal Dose Morphine

No	Development		Lenght	Fly Cycle	Long Cycle	Mean
1	Eggs	Rat 4	0,6mm	D1	1 Day	0,55mm
		Rat 5	0,5mm	D1	1 Day	1 Day
		Rat 6	-	-	-	
2	Instar Larvae 1	Rat 4	3,8 mm	D2	1 Day	4mm
		Rat 5	4mm	D2	1 Day	1 Day
		Rat 6	4,2mm	D1	1 Day	
3	Instar Larvae 2	Rat 4	6,8mm	D3	2 Days	6,9mm
		Rat 5	8,5mm	D3	2 Days	2 Days
		Rat 6	5,5mm	D2	1 Day	
4	Instar Larvae 1	Rat 4	16,2mm-	D5	1 Day	16,1mm
		Rat 5	18,2mm	D5	1 Day	2 Days
		Rat 6	14,1mm	D3	3 Days	
5	Prepuppae	Rat 4	10mm	D6	1 Day	10,7mm
		Rat 5	11mm	D6	1 Day	1 Day
		Rat 6	11mm	D6	1 Day	
6	Puppae	Rat 4	12,3mm	D7	2 Days	10,7mm
		Rat 5	12,2mm	D7	3 Days	3 Days
		Rat 6	7,5mm	D7	3 Days	
7	Fly	Rat 4	-	D9	-	-
		Rat 5	-	D10	-	
		Rat 6	-	D10	-	
8	Fly Development					10 Days

Table X Larvae Length Growth Every Day and Larvae Photo on Rat 7 (Lethal Dose Arsine)

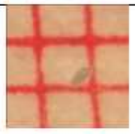
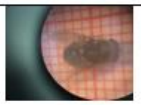
DAY	OBSERVATION	SIZE	PHOTO
D0	There were no eggs	-	-
D1	Clear whiter Instar Larvae 1 was found	0,6mm	
D2	Clear whiter Instar Larvae 1 was actively moving	3,1 mm	
D3	White Instar Larvae 2 was very actively moving 3	6,3 mm	
D4	White Instar Larvae 3 was actively moving	8,1 mm	
D5	White brownish Instar larvae 3 was actively moving	8 mm	
D6	White brownish Instar larvae 3 was less actively moving	14 mm	
D7	Brown darkish prepupae was found	11mm	
D8	Brownish pupae were found	12,3mm	
D9	**Still same with D8**		
D10	**Still same with D9**		
D11	Fly Crysoma Sp was found		

Table XI Larvae Length Growth Every Day and Larvae Photo on Rat 8
(Lethal Dose Arsine)

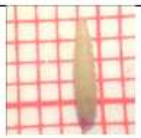
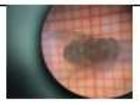
DAY	OBSERVASION	SIZE	PHOTO
D0	There were no eggs	-	-
D1	Clear white eggs were found	0,7mm	
D2	Clear whiter Instar Larvae 1 was actively moving	3,3 mm	
D3	White Instar Larvae 2 was actively moving	5,1 mm	
D4	White brownish Instar larvae 2 was very actively moving	10 mm	
D5	White brownish Instar larvae 3 was very actively moving	13 mm	
D6	Brown darkish prepupae was found	11 mm	
D7	Brownish pupae were found	11mm	
D8	**Still same with D7**		
D9	**Still same with D8**		
D10	Fly Crysoma Sp was found		

Table XII Larvae Length Growth Every Day and Larvae Photo on Rat 9
(Lethal Dose Arsine)

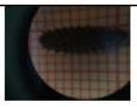
DAY	OBSERVATION	SIZE	PHOTO
D0	There were no eggs	-	-
D1	Clear white eggs were found	0,61mm	
D2	Clear whiter Instar Larvae 1 was FOUND	3,4mm	
D3	White Instar Larvae 2 was actively moving	6 mm	
D4	White Instar larvae 3 was very actively moving	8 mm	
D5	White Instar larvae 3 was very actively moving	12,3 mm	
D6	Brown darkish prepupae was found	11 mm	
D7	Brownish pupae were found	12,1mm	
D8	**Still same with D7**		
D9	**Still same with D8**		
D10	Fly Crysoma Sp was found		

Table XIII Fly Cycle Development on Whistar Rat Carcasses with Lethal Dose Arsine

No	Development		Lenght	Fly Cycle	Long Cycle	Mean
1	Eggs	Rat 7	0,6mm	D1	1 Day	0,6mm
		Rat 8	0,7mm	D1	1 Day	1 Day
		Rat 9	0,6mm	D1	1 Day	
2	Instar Larvae 1	Rat 7	3,1 mm	D2	1 Day	3,3mm
		Rat 8	3,3mm	D2	1 Day	1 Day
		Rat 9	3,4mm	D2	1 Day	
3	Instar Larvae 2	Rat 7	6,3mm	D3	1 Day	6,6mm
		Rat 8	7,5mm	D3	2 Days	1 Day
		Rat 9	6mm	D3	1 Day	
4	Instar Larvae 1 3	Rat 7	10mm	D4	3 Days	11mm
		Rat 8	13mm	D5	1 Day	2 Days
		Rat 9	10,1mm	D4	2 Days	
5	Prepuppae	Rat 7	11mm	D7	1 Day	11mm
		Rat 8	11mm	D6	1 Day	1 Day
		Rat 9	11mm	D6	1 Day	
6	Puppae	Rat 7	12,3mm	D8	3 Days	11,8mm
		Rat 8	11mm	D7	2 Days	2 Days
		Rat 9	12,1mm	D7	2 Days	
7	Fly	Rat 7	-	D11	-	-
		Rat 8	-	D10	-	
		Rat 9	-	D10	-	
8	Fly Development					10 Days

Table XIV Fly Cycle Development on Whistar Rat Carcasses with Death cause of Cervical Dislocation, Lethal Dose Morphine, and Lethal Dose Arsine on Medan City

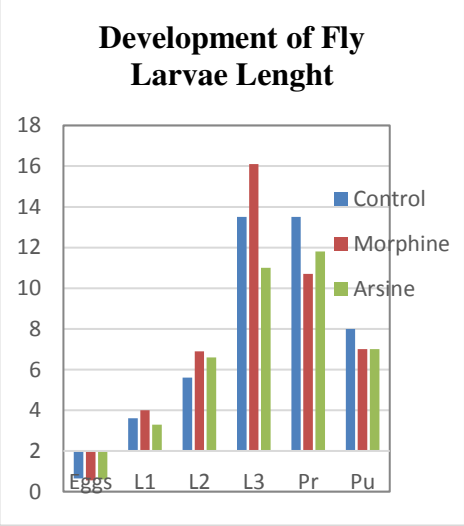
No	Development		Lenght	Fly Cycle	Long Cycle
1	Eggs	Cervical Dislocation	0,65mm	D0	1 Day
		Morphine	0,55mm	D1	1 Day
		Arsine	0,6mm	D1	1 Day
2	Instar Larvae 1	Cervical Dislocation	3,6mm	D1	1 Day
		Morphine	4mm	D2	1 Day
		Arsine	3,3mm	D2	1 Day
3	Instar Larvae 2	Cervical Dislocation	5,6mm	D2	1 Day
		Morphine	6,9mm	D3	2 Days
		Arsine	6,6mm	D3	1 Day
4	Instar Larvae 3	Cervical Dislocation	13,5mm	D3	3 Days
		Morphine	16,1mm	D5	2 Days
		Arsine	11mm	D4	2 Days
5	Prepuppae	Cervical Dislocation	13,5mm	D6	2 Days
		Morphine	10,7mm	D6	1 Day
		Arsine	11mm	D6	1 Day
6	Puppae	Cervical Dislocation	10,4mm	D8	4 Days
		Morphine	10,7mm-	D7	3 Days
		Arsine	11,8mm	D7	2 Days
7	Fly Development	Cervical Dislocation	-	D12	12 Days
		Morphine	-	D10	10 Days
		Arsen	-	D10	10 Days

Flies eggs in the treatment of arsenic and morphine rat carcasses were found after H + 1 observations while in control rat carcasses were found in H0. This is because:

- The influence of administering chemicals (arsenic and morphine) with lethal doses contained in the rat carcass meat reduced the attraction of flies to lay their eggs compared to the rat carcasses in the control treatment.
- Giving this chemical, also has an influence in the form of toxic effects on some flies that descend the carcass of mice, especially in this treatment. This causes a reduction in the population of flies in the cage.
- Flies that lay eggs in H + 1 on morphine and arsenic rat carcasses are possible laying media that are only available in the cage only the corpse of the rat because the control carcass has been moved to another cage.
- Anaerobic bacteria that are in the digestive tract of rat's experience poisoning due to the toxic effects of these chemicals. Rahman *et al.,* (2004) mentioned that arsenic has a high toxicity effect against bacteria, fungi and insects. This is related to the process of decomposition that occurs, where insect interest arises because of the presence of ammonia compounds produced by anaerobic bacteria.
- The decomposition process of the corpse also influences the succession of insects besides environmental factors. In the

bloating phase where the gases in the body resulting from the catabolism of organic substrate by inorganic bacteria begin to fill the cavities of organs in the corpse, this spurs the decay process faster. Ammonia gas that is starting to emerge from the body attracts many insects around it (Greenberg, 2014).

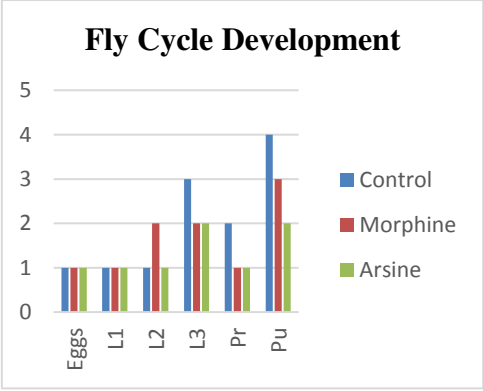
- The gas produced by the anaerobic bacterial metabolic activity causes distension in the stomach of the corpse. Furthermore, the internal temperature rises during this stage as a result of the activity of spoilage bacteria and the metabolic activity of the fly larvae. Flies from the family Calliphoridae are very interested in corpses during this stage (Gof., 2000., Gennard. 2012)
- Besides this, when viewed from the readiness of flies to lay eggs from the flies provided are also different, where there may be flies that are ready to lay eggs and who are not ready to lay eggs on the media of dead rats.



The results showed that there was an influence of morphine and arsenic in rat carcasses affecting the average maximum length of Chrysomya sp. On observation on the day of H0, each treatment showed that the instar larvae I Chrysomya sp had a length that was not too different.

This is presumably because the first instar larvae hatched and only ate a little meat. Based on observations of control larvae length, in morphine and arsenic can be seen that the treatment with morphine rat carcasses tends to show the highest larval length compared to other treatments.

Larvae on morphine rat carcasses that have a longer size than other treatments may also be caused by the disruption of juvenile hormonal activity in larva metamorphosis after eating rat meat containing morphine. Bower (1971), states that the metamorphosis stage is a sensitive and complex period, in which the influence of the juvenile hormone exerts effects such as the formation of longer larvae. Juvenile hormones in insect function to suppress adult characteristics by maintaining the structure of larvae (Hadi *et al.,* 2009)



From the results of observations on the duration of the development of flies, it can be seen that each treatment has a different duration of stage achievement. In the egg phase, it can be seen that all treatments require the same time from the eggs reaching instar I, which is 1 (one) day. The same thing is in the first instar stage to second instar, which still requires the same time for all treatments that is 1 (one) day. Instar I metamorphosis to instar II begins to show a difference in duration, where in the morphine treatment takes two days while in the arsenic control treatment one day. Furthermore, at the instar stage three control larvae had 3 days, morphine carcass rat larvae and arsenic 2 days.

The total duration required from eggs to adulthood in control rat carcasses is 12 days while in morphine and arsenic rat carcasses is 10 days. The effect of morphine and arsenic is thought to accelerate the attainment of the larval stage of the fly, where morphine acts like acetylcholine. Morphine has a specific effect on the central nervous system. The system has controls, including the hormone ecdyson and the juvenile hormone.

Ecdyson and juvenile hormone titers influence metamorphosis. In the process of larvae to molt larvae. The second titre of this hormone is high. Whereas the metamorphosis process occurs when the ecdison hormone is high and juvenile is low (Ware GW and Whitcare, 2004).

In this study, measurements of temperature, humidity and height of rainfall were not carried out and looked at the life cycle types of flies based on species of flies that landed. So that the next research should be carried out specifically in terms of the factors in the cycle.

Conclusion

Based on the results of the above research and the discussion above, the following conclusions can be drawn:

- The administration of morphine and arsenic is very influential on the fly's development cycle which is faster than the control.
- The administration of morphine and arsenic influences the growth of larval length significantly higher than larval growth in growth media not exposed to lethal doses of morphine.
- The administration of morphine and arsenic affects the time of laying eggs longer.
- The administration of morphine and arsenic is very influential in the process of rat decay

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