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To Examine the Decomposition of Hen Meat at Different Conditions by Observing its Entomological Changes

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ABSTRACT:

In this research we conducted a 72 hours decomposition of raw chicken meat. As we know that by studying the insect's life cycle we conclude the time of death because every insect has a different life cycle which they show on rotten meat. These insects feed on the meat which helps the meat to decompose. So here entomological study is important because it provides us the knowledge of insect life cycle and this study is also crucial in the field of forensic science. So here we examine the meat in two different conditions: one meat which is placed in soil and the other one placed in an open area. This research was carried out at Indore, Madhya Pradesh in the month of October.

Keywords: Decomposition, Insect Life Cycle, Entomological Study, Forensic Science.

1.Introduction:

Entomology is defined as the study of insects and their relationship with respect to humans, environment, and other organisms. Entomologists give great contributions to various fields like agriculture, chemistry, biology, molecular science, criminology, and forensics.
Forensic entomology is the study of insects/arthropods in the criminal justice system/ criminal inspection. From the primary stage's insects are attracted to the decomposing body and may lay eggs in it. By studying the insect population and the developing larval stages, forensic scientists can estimate the post-mortem index, any change in position of the corpse as well as the cause of death. Father of modern forensic entomology is Bernard Greenberg.

Role of Forensic Entomologist: -

1.Forensic Entomologists' major role is to examine the corpse body which iscolonised by insects.
2.By examining the insects, the entomologists will give a round off idea about the time of death of the deceased.
3.A forensic entomologist may collect adults, eggs, and larvae as a form of evidence; identify the type of arthropod present; and use that information to assess time since death.

Forensically important insects & their arrival time at corpse body: -

There are many different kinds of arthropods which are involved in human decomposition, but the two most important groups are flies (Diptera) and beetles (Coleoptera). The flies are attracted to moist tissue and thus are early arrivals to remains. The fly larvae are responsible for considerable reduction of soft tissue. In the overall life cycle, beetles generally arrive later, which are more attracted by dried tissues. Other arthropods may also arrive to consume feeding insects.
Until 72hrs from the time of death, forensic methods are equally or more accurate than the insect evidence. However, after 3 days, insect evidence is often the most accurate and sometimes the only method of determining elapsed time since death.

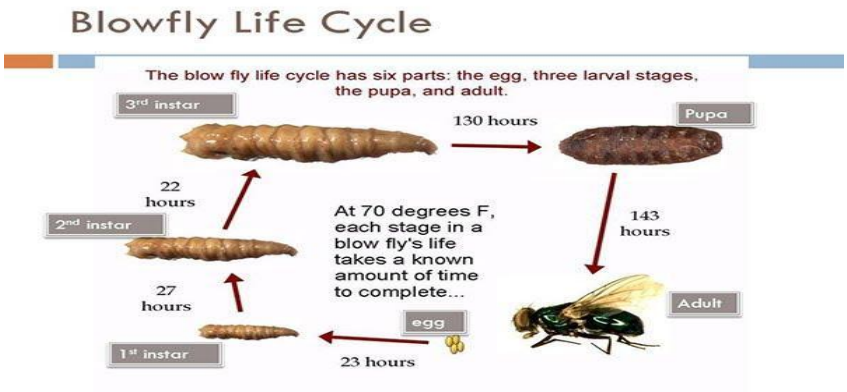
There are two main ways of using insects to determine elapsed time since death: -
I-Using successional waves of insects.
The first method is used when the corpse has been dead for between a month up to a year or more.
II - Using maggot age and development.
The second method is used when death occurred less than a month prior to discovery.
Some common insects are:
1. Flies: Flies are the first one to get attracted towards the dead bodies
2.Beetles: These are often found on old cadavers, or in dry conditions.
3.Ants: These generally consume smaller cadavers and belong to order-Hymenoptera.

1.1 Procedure for the experiment:

Materials Required- Chicken meat pieces, Ruler, Camera, Pot filled with soil, Plastic Sheet, etc.
Procedure for the experiment-

1. For conducting the experiment first, we need Chicken meat pieces and we observe decomposition in two different parameters with the changes occurring until 72 hrs.
2. Here we need a pot filled with semi wet soil and a piece of meat with length 5.4 cm, 2.2 inch which we name Sample A .
3. Now we took the other meat piece with bone whose length is 6.5 cm, 2.5 inch which we called Sample B and it was placed in a black plastic sheet in the manner like 1 part touches the plastic area and the other part is in direct contact with air.
4. At the time of placing the samples , both are soft , fresh with little amount of blood on its skin.
5. The samples are placed in a shady area of an open terrace where it doesn't get contacted with sun but with the wind.
6. For 3 days , we have to observe the changes occurring in both the samples and write down the observations and the difference in decomposition changes happened in both the samples .
7. Also we have to photograph the samples from day 1 to day 3 with and without a ruler.

Life cycle of botfly:-



2. Observation Table with Photos:-

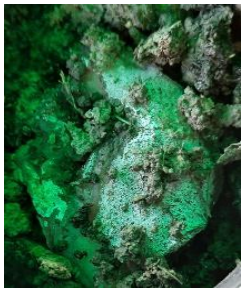
Traits	Cycle	Sample 1 [IN SOIL]	Sample 2 [IN AIR]
Condition [From October 2 (1:15 P.M.) to October 3 (1:15 P.M.)]	24 HOURS	1.Soft ,fresh, fleshy meat with little bloodsticksto the meat skin. 2.Soil a little bit wet. 3.Next day the meatgot a little bit dry from top and the appearance of flies occurred & blood stainsdried . Flies: Botfly 4.Soil becomes dry.	1.Soft,fresh,fleshy meat with little blood sticks with meat skin including its bone. 2.Meat becomes whitefrom the upward side and becomes a little hard. No smell is observedand the botfly starts appearing . A little blackness on meat also observed
Condition [From October 3 (1:15 P.M.) to October 4 (1:15 P.M.)]	48 HOURS	1. Soil condition is dry . 2.Meat from the upward side forms a white grey layer and from the bottom side it forms a little blackness colour . Small maggot babies start appearing in soil with botflies as well.	1.Botfly increases with a white dry layer appearing at almost every area of the meat. Small baby maggots are also observed at the bottom side of the meat with a mild rotten smell. Same day after some intervals of time white later changes to maroon colour.
Condition [From October 4 (1:15 P.M.) to October 5 (1:15 P.M.)]	72 HOURS	1.Soil is dried from top and from bottom where meat is in direct contact and is wet due to the presence of liquidy sticky substances coming out from meat. Very strong rotten smell comes from the meat and from the bottomside the thicknessof the meat decreases. An upward layer white dried layer with maroon colour and black patches on some areas is also observed. Also a large number of different sized maggots were observed on the bottom area.	1.Meat colour becomes dark maroon colour with little black patches on it. Rotten smell observed with less amount of botflies at top surface of meat and baby and adult maggots at bottom side. On the plastic sticky liquid also observed.

Pictures of Experiment:

I. IN SOIL :-



24 hours changes



48 hours changes




72 hours changes

II. IN AIR :-


24 hours changes



48 hours changes



72 hours changes

Comparisonbetween both samples:

1. In soil we observe the decomposition rate of meat was high compared with decomposition of meat whose one side was in direct contact with plastic.
2. We observe, meat turned out black more rapidly on the surface which was in direct contact with air compared with the meat dipped in soil.
3. White maggots which are larvae of botflies were more in the meat bottom area which was placed in soil and less in the other sample.
4. In soil the chicken doesn't harden that much compared to the chicken placed in plastic.
5. On the 3rd day the smell coming from the chicken in the soil is more compared with the other sample.

3.Result:

After performing the practical , observing the changes, and comparing the differences , we concluded that decomposition rate was fast in soil and slow in the meat placed in plastic.

4.Conclusion:-

In this research we concluded that the environment plays a very important role for the decomposition of the dead body of a deceased person . We understood this by examining the flesh at different conditions like the first sample which was in direct contact with soil and the second sample we put it in plastic. So by that we understand that natural things play a very important role for fast decomposition which we observe in the first sample which was in direct contact with soil. On the other hand the decomposition rate was slow in the second sample which was in direct contact with plastic. In this research we also observe the entomological importance in forensic science like if we found any dead body so by examining the life cycle of any insect we can we can understand he post-mortem changes happen in that particular body also in this research we observe the life cycle of botfly and the formation of maggots like baby and adult one. With this we concluded that forensic entomology gives us very crucial evidence when we don't have any other trace evidence to examine.

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