

## PLANNING OF FLY TRAP FOR TEMPORARY DOMESTIC WASTE IN HOSPITAL TO REDUCE THE INTENSITY OF FLY

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### ABSTRACT

Crowds of flies will add to the burden of everyday life. Moreover, if the flies try to eat the fly, they will be caught in the trap placed in the container's open mouth. Therefore, the fly population at X Hospital, Tulung Agung, should be controlled to a non-hazardous extent. This study analyzes the practical design for catching flies in the temporary hospital waste collection area. Fly traps are designed based on design criteria. Where fly traps can be made of wood and wire mesh to form a cylinder, inside which the flytrap is placed cone-shaped wire mesh. The fly trap, which has a length of 165 cm, a width of 180 cm, and a height of 30 cm, will be applied in a closed container with a capacity of 6 m<sup>3</sup> and dimensions of 3.3 meters in length, 1.8 meters in width and 1.2 meters in height. This eco-friendly fly trap is made using perforated anti-mosquito wire mesh and arranged on top of the container. At the same time, the flies obtained can be used according to the needs that will be used.

**Keywords:** *Fly trap, hospital, waste*

### 1. INTRODUCTION

Waste is a severe environmental problem faced by Indonesia and the world (Sari *et al.*, 2022; Sari *et al.*, 2023; Septiariva *et al.*, 2022). It can be said that the number of waste humans produce daily is organic and inorganic (Ayilara *et al.*, 2020). Existing waste can cause flies' growth and harm environmental health (Dhia *et al.*, 2022).

Crowds of flies will add to the burden of everyday life. Flies annoy people both at work and at leisure when resting. Disturbance to the peaceful life of humans and animals can also result in severe conditions. Work productivity

and production decrease when there are many flies in the environment. Flies litter the outside and inside of the house. Flies have a psychological effect that is not only a nuisance but also their presence is a sign of unhealthy conditions (Daniel, 2020). The role of flies in public and animal health has been widely known (Bertolini *et al.*, 2023). In connection with his life behavior that likes dirty places, namely piles of garbage, food, and feces, flies carry various disease-causing microorganisms (Afifah *et al.*, 2020; Wahyuni *et al.*, 2019). In addition to being very annoying, flies also act as mechanical vectors of several diseases (Brewer *et al.*, 2021).

Poor sanitary conditions, such as the lack of public toilet facilities and waste control, can cause diseases, one of which is diarrhea (Adicita *et al.*, 2021; Rizal *et al.*, 2022; Suryawan *et al.*, 2021, 2022). This will grow various disease vectors that interfere with the population's health, originating from flies. Diarrhea is still the leading cause of child death (Das *et al.*, 2014). Environmental conditions for breeding flies are near human and animal feces, waste generation, and processed food scraps (Amrul *et al.*, 2022). The insect flies perch on human feces, which have various kinds of bacteria, so the mechanism of flies spreads the infection or diarrheal disease to other people, namely through the skin and feet, which carry pathogenic microorganisms. Disease vectors from flies can also spread itching of the skin, cholera, and digestive disorders (Neogi *et al.*, 2014). Therefore, it is necessary to carefully control fly disease vectors to avoid contact between humans and flies and prevent the spread of diseases that can disrupt the health environment of the population.

The physical eradication method is easy and safe, but it is less effective when applied to

places where the density of flies is high (Cook, 2020). Therefore, this method is only suitable for use on a small scale, such as in hospitals, offices, hotels, supermarkets, and other shops that sell meat, vegetables, and fruits. Flies in large/dense numbers can be caught with fly traps. A place that attracts flies to breed and find food is a dark container. If the flies try to eat the fly, they will be caught in the trap placed in the container's open mouth.

The fly population at X Hospital, Tulung Agung, should be controlled to a non-hazardous extent. Control can be carried out at various stages in its life cycle, from eggs to adults. Control of flies can be done in various ways, both physically, chemically, biologically, and culturally. To minimize the negative impact of using insecticides, it is necessary to develop fly control methods based on factors that affect their density and distribution. This study analyzes the practical design for catching flies in the temporary hospital waste collection area.

## 2. METHOD

The limitation of the problem in completing this research is the area of the public garbage collection area at X Tulungagung Hospital, East Java. The main discussion in this research is how to control the intensity of flies in the area

so that the area around the hospital is protected from fly-related diseases and the environment is maintained. The research data used is in the form of secondary data, namely data on the intensity of flies in 2021 from the sanitation installation of X Tulungagung Hospital using a sampling technique to collect data using a tool in the form of a fly grill.

Fly traps are designed based on design criteria. Where Fly traps can be made of wood and wire mesh to form a cylinder, inside of which the flytrap is placed cone-shaped wire mesh. To apply this tool, bait is given to attract flies as an attraction. Then a literature review consisted of studies on previous studies related to the application of the fly trap. A literature review was conducted to determine whether the research had been carried out in addition to knowing the differences between previous research and research that will be carried out.

## 3. RESULT AND DISCUSSION

The fly trap design applied to the container is a top view, side view, and front view (Figure 1-3). The fly trap, which has a length of 165 cm, a width of 180 cm, and a height of 30 cm, will be applied in a closed container with a capacity of 6 m<sup>3</sup> and dimensions of 3.3 meters in length, 1.8 meters in width and 1.2 meters in height.



Figure 1. Fly trap view above

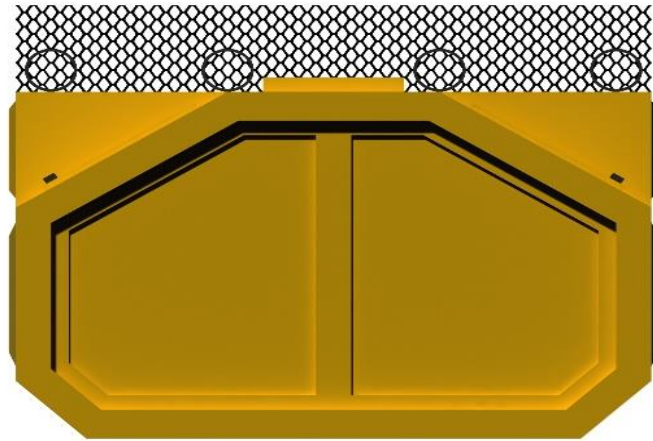


Figure 2. Fly trap front view

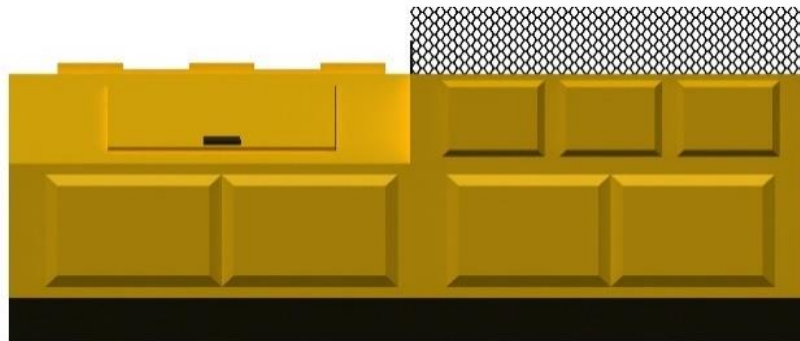


Figure 3. Side view of the fly trap

Flies are insects that are autotrophic; that is, they like light. Therefore a tool is needed where the attractant acts as bait and is placed in a trap whose walls are covered with wire mesh. So that after the fly is full of eating the astrakhan, it will fly in a vertical direction, namely toward the direction of light. However, the space has been covered by wire netting, so flies are trapped. The advantages of designing this tool are that materials are easy to obtain, relatively easy to design, friendly to the environment, and with a lightweight body or design that is easy to apply on containers.

Meanwhile, the drawback of this alternative lies in the smell of Tarakan, which cannot be controlled because it comes from shrimp waste. Atrakan is a material that attracts or brings insects closer and enters the trap set. Attraction is towing by relying on the aroma of the attraction used (Bodnár *et al.*, 2022).

### **Tool Making Stage**

This eco-friendly fly trap is made using perforated anti-mosquito wire mesh and arranged on top of the container. The choice of material from the perforated wire is intended so that the smell of waste can be smelled inside so flies can also be attracted to enter the fly trap. Flies are phototropic insects that are very fond of light. Therefore, a bright yellow funnel attracts flies to the fly trap (Kammar *et al.*, 2020). Furthermore, the funnel is made conical so that when the fly enters the tool, it cannot find its way back out. So that when flies fly in a vertical direction, namely towards the direction of light or light, but the walls of the bright room are covered by wire mesh, then the flies will be trapped in the fly trap. To ensure that the flies can really be attracted and the effectiveness of the removal is high, astrakhan is added in the form of previously rotted shrimp. Bait could

trap as many as 1374 flies with a percentage of 86% by setting traps for 2 hours (Tempat *et al.*, 2015).

### Stages of Making Bait and Application of Bait in the Tool

Furthermore, in the bait-making stage, the bait must be prepared for at least a day before being used as a trap. The bait used must be decomposed first for about 5 to 7 days. Ensure the bait is half crushed, slimy, soft in consistency, and has a strong odor. Then the bait, if possible chopped and weighed. The percentage of attractants used is 80% bait (fish waste, rotten tempeh, and shrimp) and 20% molasses (molasses) (Fitri & Sukendra, 2020). When applying organic bait in an eco-friendly fly trap, the bait is placed at the bottom of the tool. Each bait is placed at a distance of 50 cm. Furthermore, flies trapped in the tool can be counted. Therefore, the amount of feed that can be given is a composition of 80% organic feed and 20% molasses.

### Stage of Intake of Flies

The method of taking flies inside the trapped eco-friendly fly trap can use a way to intoxicate the flies by using basil plants as an alternative. Beforehand, the fly trap is lifted and moved first from the trash container so that the trash in the container is not affected by basil oil, which might reduce the attraction of flies to the trash. After lifting, it is placed some distance from the container. Next, Basil oil can be sprayed into the fly trap, intoxicating the flies to reduce fly locomotion (Dwi Anugraheni & Asngad, 2018). Then after a few minutes, the drunk flies can be transferred to the prepared container (sealed container). Then the fly trap is left for a while so that the smell of the remaining basil oil can disappear. Then it is placed back on top of the container. At the same time, the flies obtained can be used according to the needs that will be used.

### 4. Conclusion

Cone-shaped wire mesh may be used inside fly traps constructed out of wood and wire mesh to form a cylinder. This cylinder serves as the fly trap. The fly trap, which has dimensions of 165 cm in length, 180 cm in

width, and 30 cm in height, will be utilized in an enclosed container that has a volumetric capacity of 6 cubic meters and dimensions of 3.3 meters in length, 1.8 meters in width, and 1.2 meters in height. The perforated anti-mosquito wire mesh used to make this fly trap is stacked on top of the container to create an environmentally friendly device. The selection of the material consisting of the perforated wire was made with the intention that the odor of waste would be able to be detected within the fly trap, which would then entice flies to enter the trap. After that, the fly trap is set aside for some time so that the aroma of the unused basil oil can dissipate, and then it is repositioned on top of the container. While the flies that have been gathered can be employed according to the requirements that will be used, these requirements will be used.

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