

## The Right-Wing of Fly (*Musca domestica*) as a Neutralization of Drinks Contaminated by Microbe

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(Received June 11, 2019)

**Summary** Rasulullah Shallahu'alaihiwassalam said, “if a fly falls in the vessel anyone of you, let him dip all of it (in the vessel) and then throw it away, for in one of its wings has the ailment and the other has the cure” (Al-Bukhari). This hadith creates controversy because in general flies are a vector for the spread of disease from dirty places to food or drinks. Therefore, the research was conducted on right-wing of fly (*Musca domestica*) as neutralization of drinks contaminated by a microbe. This research used the method of Complete Random Design by 5 treatments and 2 repetitions. The treatment was done by sterilized water (positive control), drinking water added to the bacteria *Escherichia coli* (negative control), and drinking water contaminated by *Escherichia coli* bacteria with the addition of 1, 2, and 3 flies right-wings. The research began with taking the right-wing of fly and continued with the dilution of *Escherichia coli* culture tubes up to 6 times. The bacterial culture inoculation was carried out using Pour Plate method on Eosin Methylene Blue agar which is incubated for 12–48 h at a temperature of 37°C. Data retrieval is done by observing the calculation of the number of microbes using a colony counter every 12 h. The data which obtained for 48 h incubation show “0” as the result, that cannot be analyzed with SPSS. The result indicates the microbial development does not occur on contaminated drinks by addition with right-wing of *Musca domestica*.

**Key Words** neutralization, drinks, *Escherichia coli*

The bacteria carried by flies is one of the causes of food contamination and drinks (1). Flies as a mechanical vector carry the pathogens through the parts of body such as hairs on the legs, body, wings, and its mouth (2). Research on landfill garbage at Padang city obtained that isolate bacteria from the outer surface of flies *Musca domestica* and *Chrysomya megacephala* are *Enterobacter aerogenes*, *Escherichia coli*, *Proteus sp.*, *Bacillus sp.*, and *Serratia marcescens* (3).

According to epidemiology, flies have a crucial role in displacement of disease agents, one of them is *Escherichia coli* bacteria. If the bacteria is found in the intestine and enter the bladder, that will cause a cystitis disease (4). The presence of these bacteria indicates that there is a poor sanitation practices because *Escherichia coli* can move actively or passively (5).

Many studies declared that flies are vectors for the spread of disease. However, Rasulullah Shallahu'alaihiwassalam said in the hadith, “if a fly falls in the vessel of anyone of you, let him dip all of it (in the vessel) and then throw it away, for in one of its wings has the ailment and the other has the cure” (Al-Bukhari) (6). The hadith is clearly contrary to the facts in the field thus causing a lot of controversy from various parties. Muslims must still believe and be sure of the truth of this hadith because it is sourced from Rasulullah Shallahu'alaihiwassalam as well as ulama have agreed that

the hadith is *shahih* and having steady attribution (الإسناد ثابت) from three friends named; Abu Hurairoh, Abu Sa'id al Khudri, and Anas Ibn Malik *Radhiyallahu'anhum*.

Based on research conducted by Aj-Taili et al., (7) it is known that there is no growth of bacteria on the right wing of the fly and on the contrary there is growth of bacteria on the left wing of the fly. Therefore, further research is needed on the use of the fly's right-wing towards drink contaminated by microbe especially microbial pathogens such as *Escherichia coli*. This research is expected to be a reference in the development of antibacterial on fly's right-wing as well as the evidence to the truth of hadith Rasulullah Shallahu'alaihiwassalam as a basis of the science theory.

### MATERIALS AND METHODS

This research is an experimental research using Completely Randomized Design (CRD). The preparation was done with 5 treatments and 2 repetitions. Treatments are in the form of sterilized drinking water (positive control), drinking water added to the bacteria *Escherichia coli* (negative control), and drinking water contaminated by *Escherichia coli* bacteria with the addition of 1, 2, and 3 fly's right-wing (treatment).

The stages of research began with the taking of the right-wing of *Musca domestica* in aseptic technique. The research continued with the dilution of the bacteria *Escherichia coli* culture thinned up to 6 times. On the

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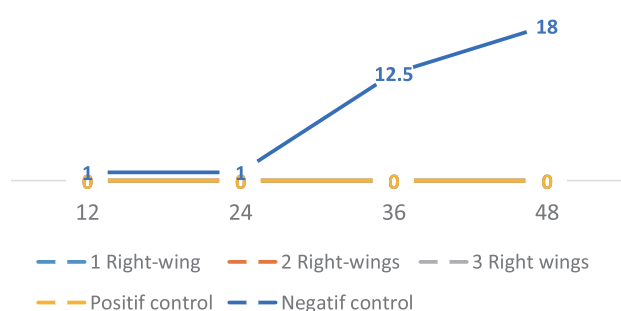


Fig. 1. The change amount of microbes with the addition of fly's right-wing in time unit.

last dilution, it is added with 1, 2 and 3 right-wings of fly *Musca domestica*. The treatments were inoculated on agar media (*Eosin Methylene Blue*) with the Pour Plate method. Agar which has been solidified is incubated for 12–48 h at a temperature of 37°C.

The data retrieval by observing the calculation of the amount of microbes using a *colony counter* every 12 h. Variables are measured based on the number of colonies on a petri dish.

The study was carried out in November 2017 to April 2018 in the laboratory of Microbiology Nutrition at Darussalam Gontor University.

## RESULT

According to Fig. 1, result shown that microbial growth does not occur on the positive control and microbial contaminated drinks with the addition of 1, 2, and 3 fly's right-wing. Meanwhile, on the negative control microbial growth has occurred since the first 12 h of observation.

## DISCUSSION

At the treatment given the fly's right-wing, the presence of microbial growth is invisible. This was strengthened with the occurrence of microbial growth on the negative control and no microbial growth on the positive control which both treatments are being a reference of the study. The negative control is the treatment of sterilized water added to the bacteria *Escherichia coli* while positive control only sterilized drinking water. According to the regulation of the Minister of Health of the Republic of Indonesia number 492/MENKES/SK/IV/2010 about drinking water quality requirements, the number of germs *Escherichia coli* and total bacteria koliform is 0 per 100 mL in the laboratory examination (8). This shows that the water used in the study is actually sterilized drinking water in accordance with the regulation of the Minister of Health of the Republic of Indonesia.

The results proved that the fly's right-wing can neutralize a contaminated drink by microbes although the data difference could not be analyzed because colony growth did not occur during 48 h incubation then data belonged to "0". This research is in line with the hadith Rasulullah Shallallahu 'alaihiwasallam that express, "for one of its wings has a disease and the other has the cure

for the disease". This means that the fly's right-wing acts as antidote and the left-wing carry disease. The results of this research is in line with the research conducted by the Department of Microbiology and Immunology in Egypt showing that fly's left-wing contains toxins and his right-wing contains the antidote (an antibiotic) (9).

This study was also strengthened by the addition of *Escherichia coli* bacteria in drinks which apparently did not occur at all growth in petri dishes. Based on this note, it is known that it contains antibacterial on right wing that can inhibit the growth of bacteria *Escherichia coli*. According to Shehab et al. (10), bacterial species *Bacillus circulans* are discovered on fly's right-wing with its function to produce antibiotics. This opinion is supported by previous studies that the fly pulled out on right wing that can inhibit the growth of bacteria *Escherichia coli*. *Bacteriophages* are useful for destroying germs by attacking or making use of the specific bacteria as a host (12). *Bacteriophages* which replicates in the host bacterial cell will produce the pelisis enzyme (endolysin) which causes the bacteria undergo lysis (13).

Based on the results of research conducted by the Department of Microbiology University of Qassim, the body of the fly contains *Actinomyces* bacteria which can produce antibiotics. The bacteria produce an antibiotic that can be extracted, namely *Actinomycetin* and *Actinomycin* functioning to lyse bacteria and are antibacterial and antifungi (7). The main role of *Actinomycetes* in biotechnology applications is to produce secondary metabolism having antimicrobial substances, enzyme inhibitors, immunodifiers, and enzymes (14–16).

In the hadith Rasulullah Shallallahu 'alaihiwasallam, it is also found the letters *fa* on the word *falyagmishu* (then dip it) means "the brief dip", while *tsumma* (then or ago) means "delays and slow". The hadith tells if anyone encountered a fly fell into his drink, they should dip the whole fly's body with a delay of a minute then pulling it out of the drink. This is done so that drugs (antibacterial) in the flies' right-wing spread on the surface of the water and activate positive bacteria that secrete antibiotics or medications. If someone is consuming drinking water that has been contaminated by fly's body, then the positive bacteria on the right wing will be active and react to get into the stomach with the concentration of 5 mg/mL (10). Therefore, the microbial development does not occur on a contaminated drinks by the bacteria *Escherichia coli*, even though it was only given 1 fly's right-wing.

## CONCLUSION

From the conducted research, it is proven that right-wing of *Musca domestica* fly can neutralize the drinks that have been contaminated by the *Escherichia coli* bacteria.

### Recommendation

Need for further research in the form of:

1. Development of antibacterial and compounds found in the right wing of the various species of

flies.

2. The length of time immersing a fly's body in drinking water.

*Disclosure of state of COI*

No conflicts of interest to be declared.

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