CHAPTERI

BACKGROUND

1.1 Background

One of health problems that often occur in Modern Islamic Boarding School Darussalam Gontor is typhoid fever and diarrhea. The number of activities carried out in the cottage can facilitate the entry of bacteria due to a lack of environmental cleanliness. One of the diseases caused by bacteria is digestive diseases such as diarrhea and typhoid fever. Bacteria are found almost everywhere like in nature, the digestive tract, mouth, nose, throat, and can also be found on the surface of the body. Bacteria can also come from food, drinks, air, and the environment.

Salmonella typhi is one of the gram-negative bacteria, a pathogenic bacterium that causes typhoid fever or typhus (typus), which is a systemic infectious disease with a picture of a long-standing fever, the presence of bacteremia accompanied by inflammation that can damage the intestine and liver(Cita, 2011).

Bacillus cereus is a spherical stem bacteria which is a Gram-positive bacteria. The cell is large compared with other stem bacteria grows aerobically.It causes poisoning with symptoms of vomiting and diarrhea is widespread with spores that are more resistant to environmental stress than vegetative cells (Indrawati, 2017).

The drugs used are chloramphenicol, tiamfenikol, cotrimoxazole, ampicillin, cephalosporin (Rampengan, 2008). However, these drugs require relatively high costs and have side effects. One alternative to treat typhoid fever and diarrhea is to use natural ingredients. Besides being considered safer because it has fewer side effects compared to modern medicine, the utilization of existing natural wealth can improve people's welfare. The natural ingredient to be used is a combination of turmeric extract (*Curcuma domestic Val.*) and honey. The number of female students who suffer from

this disease then treated to a combination of turmeric extract (*Curcuma domestica Val*.) and honey. So that it is expected to be an alternative medicine to treat digestive diseases such as diarrhea and typhoid fever.

Allah has explained in the letter Luqman about the creation of good plants. The words of Allah SWT are contained in QS Luqman verse 10 as follows:

خَلَقَ السَّمَاوَاتِ بِغَيْرِ عَمَدٍ تَرَوْنَهَا ۖ وَأَلْقَىٰ فِي الْأَرْضِ رَوَاسِيَ أَنْ تَمِيدَ بِكُمْ وَبَثَّ فِيهَا مِنْ كُلِّ دَابَّةٍ ۚ وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً فَأَنْبَتْنَا فِيهَا مِنْ كُلِّ زَوْجٍ كَرِيمٍ

> "He created the heavens without the pillars that you saw and He placed the mountains (on the surface) of the earth so that the earth would not shake you; and breed him all kinds of animals. And we sent down rain from the sky, Then We grew into it all kinds of good plants. "

The meaning of good plants, is all types of plants. And Allah calls it a right plant because it has beautiful colors and many benefits for other living things (humans and animals). Among the plants that are included in the good category is turmeric.

Turmeric (*Curcuma domestica Val*.) is a very popular spice plant in Indonesia. This plant has been used extensively. Besides being used as a food seasoning, other benefits of turmeric are herbal medicines that are useful for maintaining health and caring for beauty. Turmeric has also been widely used in various fields, including anti-inflammatory, anti-oxidant, anti-allergic, anti-cancer, anti-microbial, and antifungal (Jain, 2007).

In addition to turmeric, there are currently developing alternative treatments using herbs, one of which is honey. Honey is a sweet substance produced by honey bees, derived from flower nectar that generatesor from plant secretions collected by honey bees, then transformed and combined with particular substances present in the bee's body, then stored until cooked in honey cells. (Crane, 1990).

Since the time of the Prophet Muhammad, honey has been used for treatment. As Allah SWT says in the Qur'an surah An-Nahl verse 69 which reads:

يَخْرُجُ مِنْ بُطُونِهَا شَرَابٌ مُخْتَلِفٌ أَلْوَانُهُ فِيهِ شِفَاءٌ لِلنَّاسِ ۗ إِنَّ فِي ذَٰلِكَ لَآيَةً لِقَوْمٍ يَتَفَكَّرُون

"... From the belly of the bee comes a drink (honey) of various colors. Inside there are drugs that cure humans. Verily in that, there truly is a sign (the greatness of Rabb) for those who think. "

Three systemsdetermined the antibioticactivity found ishoney(JW, 1975). The three systems are acidity, osmotic pressure, and substrate inhibitors. These determinants work individually or together to reduce the presence or growth of most contaminant microorganisms (Molan, 1993).

Apart from a single extract of turmeric and pure honey, herbs can also be in combination. Pharmacologically, several drugs that work on the same receptor or are given simultaneously (in combination) can provide a synergistic response effect (Fitriani, 2016). Turmeric and multiflora honey have antibacterial properties, but it is not yet known how the antibacterial effect of the combination of turmeric extract and multiflora honey.

Currently, there are many reported cases of resistance with many drugs (multi drugs resistant). Therefore it is necessary to review more deeply the importance of research on the effectiveness of the combination of turmeric extract (*Curcuma domestica Val*.) and honey in inhibiting the growth of Salmonella typhi and Bacillus cereus bacteria in vitro. So that later can be used as an alternative therapy for typhoid fever and diarrhea.

1.2 Problem Formulation

1. How is the effectiveness of the combination of turmeric extract (*Curcuma domestica Val*.) and multiflora honey in inhibiting the growth of *Salmonellatyphi bacteria* and *Bacillus cereus* bacteria in vitro?

2. How much inhibitory combination of turmeric extract (*Curcuma domestica Val*.) and multiflora honey on *Salmonella typhi* and *Bacillus cereus* bacteria in vitro?

1.3 Research Objectives

1. To determine the effectiveness of the combination of turmeric extract (*Curcuma domestica Val.*) and multiflora honey in inhibiting the growth of *Salmonella typhi* and *Bacillus cereus* bacteria in vitro.
2. To determine the greatest inhibitory combination of turmeric extract (*Curcumadomestica Val.*) and multiflora honey on *Salmonella typhi* and *Bacillus cereus* bacteria in vitro.

1.4 Research Benefits

1.4.1 Theoretical Benefits

The results of this study can be used as a reference for further research.

1.4.2 Practical Benefits

1. The results of this study are expected to increase knowledge and broaden the reader's insight.It mainly can be used as an alternative therapy for typhoid fever and gastrointestinal disease (diarrhea) with a combination of turmeric extract (*Curcuma domestica Val*.) and multiflora honey in inhibiting the growth of *Salmonella bacteria* typhi and *Bacillus cereus* bacteria in vitro.
2. It is expected to be able to make a real contribution to the cottage as alternative medicine in the treatment of typhoid fever and digestive tract diseases (diarrhea) with a combination of turmeric extract (*Curcuma domestica Val*) and honey in inhibiting the growth of *Salmonella typhi and Bacillus cereus* bacteria in vitro.