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AIR MICROBIOLOGY CONTENT IN ULEE LHEUE PORT CITY BANDA ACEH

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ABSTRACT

The background Indoor air quality greatly affects human health, because 90% of human life is indoors. Good indoor air quality is defined as air that is free of irritating contaminants. At the port itself, many people go back and forth and roam in the waiting room, Microorganisms will come out of their hosts (humans or animals or plants), due to coughing, sneezing, dry body fluids, or due to spores (fungus). The spread of microorganisms in the air can stick to two media, namely solid particulates (dust) and water, where it can occur indoors and outdoors. The purpose of the study was to determine the microbiological content of the air at Ulee Lheue Port, Banda Aceh City. Knowing the number of bacterial colonies and types of bacteria. This research is a descriptive analytical research method. Research data obtained from the calculation of the number of colonies trapped in Na Agar. The results showed that the number of bacterial colonies in the air in 6 rooms at Ulee Lheue Harbor ranged from 11-35 CFU/m3. And the type of bacteria is Bacillus sp. It can be concluded that at the Port of Ulee Lheue the bacterial colony of Bacillus sp in the air is still below the threshold set by the Minister of Health of the Republic of Indonesia No. 1077 of 2011.

Keywords: Air Quality, Number Of Colonies

Introduction

Indoor air pollutant sources can be in the form of physical, chemical, and biological. Indoor biological pollution is in the form of microorganisms. According to research results from the United States Agency for Occupational Health and Safety or the National Institute for Occupational Safety and Health (NIOSH), found that microorganisms are one of the dangerous sources of indoor air pollution3. Microorganisms in the air are very significant elements of pollution as a cause of symptoms of various diseases including irritation of the eyes, skin, and respiratory tract (ARI) and several airborne infectious diseases including diphtheria, tuberculosis, pneumonia, and whooping cough. Protozoa, viruses, and bacteria.

Indoor microorganisms are affected by temperature, humidity, lighting, occupancy density, and ventilation At the port itself, many people go back and forth and roam in the waiting room, so it cannot be denied that there will be many bacteria flying in the air, because of the many activities carried out, whether talking or sneezing. The air itself does not have natural flora so it is not a habitat good for microbes. Pathogenic microbes in the air are only contaminants originating from droplets of saliva or particles from coughs or sneezes of people with infectious diseases. Therefore, microbes in the air are only temporary and float and are carried away by dust. The quality of the physical environment of indoor air is one of the important factors that determines the presence of microbes in the air.

Indoor air quality greatly affects human health because almost 90% of human life is indoors. Good indoor air quality is defined as the air that is free of pollutants that cause irritation, discomfort, or disruption to the health of occupants. The temperature and humidity of the room also affect the comfort and health of the occupants. Some

rooms are specifically regulated, both the temperature and the frequency of air exchange by using special ventilation equipment, some are carried out by utilizing natural weather conditions by adjusting the part of the room that can be opened. Thus the quality of indoor air varies greatly. The poor air quality will hurt workers/employees in the form of complaints of health problems.

Ulee Lheu Port is a means of supporting transportation that connects the city of Banda Aceh with the city of Sabang, of course with the Ulee Lheu port makes it easier for people to travel, and the port is a place where many people come and go.

Methods

This type of research is descriptive-analytic The population in this study is all the rooms in Ulee Lheeu Harbor which are around 20 rooms. The determination of the number of samples used in this study is to take 3 air sample points in the Ulee Lheeu port room, which ranges from 6 rooms, which are widely used and many visitors come. This research was conducted at the Port of Ulee Lheue Banda Aceh and the Integrated Lab of Poltekkes, Ministry of Health, Aceh. At the Port of Ulee Lheeu to take samples of bacteria in the air in the room, and at the Integrated Lab of Poltekkes of the Ministry of Health of Aceh to examine samples that have been taken from the Port of Ulee Lheeu. The research was conducted in June 2021 in 6 rooms in the port of Ulee Lheeu.

The research instrument is a colony counter, which is a tool to count the number of colonies. This study uses primary data, namely data obtained from the calculation of the number of colonies trapped in NA. Data was obtained from reading materials in libraries, the internet (journals), books, and theses related to the title.

Research tools and materials the tools used for research are incubator, cover glass, object glass, ose wire, petri dish, colony counter, aluminum foil, hot plate. The tool to count the number of bacteria in the petri dish is a stereo microscope/coloni counter. The material used for research is Nutrient agar (NA) as much as 15-20 ml. Research procedure :

1. hot plate until it melts.
2. Put the Nutrient agar into a petri dish as much as 15-20 ml and allow it to cool.
3. Not a little so that the microbes enter the petri dish containing the Nutrient agar and place it in the desired place for 30 minutes.
4. After 30 minutes wrap the petri dish with aluminum foil and label according to the room.
5. Put in an incubator with a temperature of 30-35, and leave for 24 hours.
6. Take a sample from the incubator to see the bacteria in the petri dish, then count the bacteria using a microscope/colony counter.
7. Burn the one wire to sterilize and after burning take the bacteria contained in the petri dish.
8. Place the bacteria in a glass object and then cover it with a cover glass and observe it under a microscope.s.

Result and Discussion

1. Number of Colonies

Samples were taken in the Ulee Lheuu port room on June 23, 2021, in 6 rooms. By using a Petri dish containing Na media which was placed open for 30 minutes. After the samples were collected, then the samples were incubated in the Integrated Lab of Poltekkes, Ministry of Health, Aceh for 1x24 hours. On

June 25, 2021, samples were examined under a microscope at the Integrated Lab of Poltekkes, Ministry of Health, Aceh.

Table 1.1 Number of Bacterial Colonies (CFU/m3) at Ulee Lheue Port in 2021

No	Room	Number of Colonies at the Laying Point				Amount	Average
		1	**2**		**3**		
1	Coordinator	55	15	105	35	105	35
2	UPTD Port	30	6	49	13	49	16
3	Cleanliness	40	25	88	23	88	29
4	Quarantine	5	25	65	35	65	22
5	Syahbandar	19	15	34	-	34	11
6	Wait	55	15	70	-	70	23

Primary data : 2021

Based on the results of research that has been carried out by researchers at Ulee Lheue Port, Meuraxa District, Banda Aceh City in 6 rooms. The average number of bacterial colonies ranged from 11-35, CFU/m3. The highest number of bacterial colonies in the Coordinator's room was 35 CFU/m3, and the least in the Syahbandar room was 11 CFU/m3.

2. Bacteriology Type

Based on the results of the examination using a microscope at the Health Polytechnic Laboratory of the Ministry of Health of Aceh, samples were taken in 6 rooms at Ulee Lheue Port, Meuraxa District, Banda Aceh City, identified as Bacillus sp.

Figure 1.1 Visible Bacteria under a Microscope

Based on the research that has been done, the average number of bacterial colonies is the most in the coordinator's room. From the observations in the room, there were many activities carried out by Ulee Lheue Port employees. Because of the many activities carried out by employees such as talking, coughing, or sneezing, the bacteria caused by the droplets released through the nose or mouth can increase the number of bacterial colonies in the room.

Based on the activity the waiting room should be a location that has the potential to have a high number of air colonies. However, this research was conducted during the Covid-19 pandemic. In June 2021 the implementation of community activity restrictions (PPKM) is valid until the end of June. The existence of PPKM causes restrictions on departure from Banda Aceh to Sabang and vice versa. When the sample was taken in the waiting room there was no passenger activity because no ship left. This can be seen from the low number of bacterial colonies in the waiting room.

In a study conducted under a microscope, the results showed that bacillus bacteria. Bacillus which is a Gram-positive bacterium can survive in unfavorable environmental conditions by forming spores. Bacillus sp. is classified as antagonistic bacteria that can suppress several diseases in plants. Bacillus bacteria can be obtained from soil, water, air, and decomposed plant matter.

Bacillus has a length of 2-3 m and a width of 0.7-0.8 m. These bacteria can grow at a maximum temperature of 45°-55°C, a minimum of 5°-20°C and the optimum temperature varies between 25°-37°C. Bacillus subtilis causes diseases that impair a person's immune function, such as meningitis and acute gastroenteritis.

Bacillus sp is classified into a class of heterotrophic bacteria, namely unicellular protists, included in the group of reducing microorganisms or commonly referred to as decomposers. Bacillus sp forms endospores that are gram-positive and move in the presence of peritrichous flagella and can be aerobic or facultative aerobic.

The bacteria that are often found are generally gram-positive, both sporing and non-sporing, gram-negative bacilli, and gram-positive cocci. Bacteria that are usually found in the mouth and throat of normal people such as Staphylococcus sp and Streptococcus sp are found in the air through coughing, sneezing, and speaking. Several other species were detected to pollute the air, including Pseudomonas sp, Klebsiella sp, Proteus sp, Bacillus sp, and a group of fungi.

Types of microbes that are mostly found as living bodies in the air are generally called contaminant bodies. A substrate that is overgrown with microbes is called a contaminated substrate. Bacteria include Bacillus, Staphylococcus, Streptococcus, Pseudomonas, and Sarcina. Molds include Aspergillus, Mucor, Rhizopus, Penicillium, and Trichoderma. While the yeasts include: Candida, Saccharomyces, and Paecylomyces.

Conclusion

From the results of the discussion above, it can be concluded that the average number of bacterial colonies in the air at Ulee Lheue Port ranges from 11-35 CFU/m3. The type of bacteria in air microbiology obtained at Ulee Lheue Harbor is Bacillus sp. Based on the results of the study showed that the number of bacterial colonies in Ulee Lheue Port was still at the threshold set by the Minister of Health of the Republic of Indonesia No. 1077 the Year 2011.

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