INTRODUCTION

Air is the essential component in life; the composition of normal Air consists of a mechanical mixture of 78.1% nitrogen gas, 20.93% oxygen, and 0.03% carbon dioxide, the rest in the form of argon, neon, krypton, xenon, and helium gases. Air contains moisture, dust, bacteria, spores, and plant debris. Air plays a role in providing oxygen, regulating the earth's temperature according to the needs of human life, and protecting the earth from sunlight, especially ultraviolet rays [1]. Indoor pollution is increasing because humans spend 93% of their time indoors, 5% traveling, and only 2% in the open Air. In addition, the importance of maintaining indoor air quality is related to the comfort of the work environment and the health of room users. Health problems can occur, especially in areas of the body or organs in direct contact with the Air, such as the skin, eyes, and nose.

Sources of air pollution can be in the form of physical, chemical, and biological pollution. Microorganisms cause sources of indoor biological air pollutants. Based on data from research conducted by the National Institution for Occupational Safety and Healthy (NIOSH), it is explained that microorganisms are one of the harmful pollutants in indoor Air. Microorganisms present in the Air are identified as the cause of various diseases, such as irritation of the eyes and skin and respiratory problems, and the Air is capable of being a medium for the spread of various infectious diseases such as diphtheria, tuberculosis, pneumonia, whooping cough [2].

Indoor air quality is the Air in a building inhabited for at least 1 hour by people with different health conditions [3]. The diversity of bioaerosols in the circulation system in a room determines air quality. Examples of airborne bioaerosols are bacteria (Legionella, Actinomycetes), fungi (Histoplasma, Alternaria, Penicillium, Aspergillus, Stachybotrys, aflatoxins), protozoa (Naegleria, Acanthamoeba), viruses (Influenza). To a limited extent, the existence of bioaerosols cannot affect anything, but in certain quantities and inhaled will cause respiratory infections such as asthma and allergies [4]. One of the biological substances found in the Air is microorganisms. Microorganisms scattered in space are known as bioaerosols. Bioaerosol is a collection of particles such as spores, pollen, bacterial cells, and viruses suspended in a gas medium [5].

One of the microorganisms that are often found in the room is bacteria. Bacteria in the Air is a significant element of pollution because it can cause upper respiratory tract infections, tuberculosis, pneumococcal pneumonia, meningococcal meningitis, and troop disease. According to the Decree of the Minister of Health of the Republic of Indonesia, the number of bacteria in the room must meet indoor air quality standards. Types of bacteria such as Staphylococcus sp and Streptococcus sp are found in the Air through coughing, sneezing, and talking. Several other species were detected to contaminate the Air, including Pseudomonas sp Klebsiella sp, Proteus sp, Bacillus sp, and fungi [2].

Indoor air bacteria are commonly found in public places, including classrooms. As one of the educational institutions, the factors that can support the teaching and learning process must be met. One of the factors that can support the teaching and learning process are health and the learning environment. The Darur Abror Foundation school classrooms are used as a place for teaching and learning. The room that is often used has the
potential to pollute the air quality in the room. Especially microorganisms in the form of bacteria if not done with proper hygiene care. As explained above, poor air quality will have a high risk of contracting a disease. According to the Decree of the Minister of Health of the Republic of Indonesia No. 1405/Menkes/SK/XI/2002, the indoor air bacteria count index has a maximum concentration limit of 200-500 CFU/m$^3$.

**RESEARCH METHODS**

This type of research is Experimental. The tools used are (1) Cool Box; (2) Autoclave; (3) Rubber Bulb; (4) Bunsen; (5) Petri dish; (6) Erlenmeyer; (7) Incubator. The materials used are (1) Aquades; (2) Alcohol; (3) Handscoo; (4) Labels; (5) Nutrient Agar (NA). The research procedure was carried out by making 250 milliliters of NA medium, which was previously sterilized for 20 minutes at 121°C in Petri dishes (tools) and NA media. Then after the manufacture of the agar medium and the sterilization process is complete, the agar medium is poured into a petri dish then, covered with a sterile Petri cover, and allowed to stand until the agar medium solidifies. Then it is ready to be used in the field. After that, six Petri dishes of NA media were prepared for indoor testing, of which 2 Petri dishes were in the morning and 4 Petri dishes in the afternoon. Each Petri containing agar medium was then placed at a predetermined sampling point. The Petri cover was left open, so the medium was exposed to room air and left for 15-30 minutes. After 15-30 minutes, the Petri is then put into a Cool box in the laboratory, and the sample is incubated for 2 times 24 hours. After incubation, the sample examination method was carried out; the colonies that grew after being incubated for 2 x 24 hours at 37°C were counted on the media with units of CFU/m$^3$. Bacterial colonies that grow after incubation are counted with the following requirements: (1) Large, small, spreading colonies are counted as 1 colony because they are considered to come from one bacterium; (2) Counting can be done manually by putting a dot on the counted colonies, and (3) According to the Permenkes the germ number index obtained is given in units of CFU/m$^3$. Conversion: 1 colony CFU/m$^3$ = 35.32 CFU/m$^3$ Where the standard of the Minister of Health No. 1405/MENKES/SK/XI/2004, the germ number is 200-500 CFU/m$^3$.

**RESULTS AND DISCUSSION**

**Number of Bacteria Index**

The results of measuring the number of germs in two classrooms at the Darur Abror Foundation were determined according to the Indonesian minister of Health category, which can be seen in Table 1.

| Code | Sample | Parameter       | Result  | Units | Information | PERMENKES No.1405 2002 |
|------|--------|----------------|---------|-------|-------------|------------------------|
| Class A | Morning | Air bacteriology | 1,171.52 | CFU/m$^3$ | DC | 200-500 |
| Class B | Morning | Air bacteriology | 2,699 | CFU/m$^3$ | DC | 200-500 |

**Bacteria Size Characteristics**

Characteristics are the characteristics possessed by one bacterium in terms of shape, size, surface, color, elevation, and margins [6-8]. The observation of characteristics can be done utilizing macroscopic observations. Macroscopic morphological observation looks at the characteristics of bacteria according to size, shape, surface, color, elevation, and margins. The results of Table 2 show that the 2 classrooms studied at the Darul Abror Foundation at the time of collection in the morning. The most bacterial size was pinpoint, with 50 colonies, and the lowest was large, with 10 colonies. Color is one of the more visible differentiators of a bacterium.

| Code | Sample | Size | Pinpoint | Small | Moderate | Large |
|------|--------|------|----------|-------|----------|-------|
| Class A | Morning | 17 | 13 | 2 | 4 |
| Class B | Morning | 33 | 19 | 17 | 6 |
| Amount | 50 | 32 | 19 | 10 |

**Characteristics According to Colony Color**

The most common colors found in the characterization of airborne bacteria are shown in Table 3.
According to the standards will affect the bacterial characteristics according to the cleanliness of the room in the morning. The number of bacterial colonies in the room at Diponegoro University environmental engineering library is 34 CFU/m³, while the average number of germs in the room is 200-500 CFU/m³, so it is not by the maximum limit that has been determined. In the library room at Diponegoro University, where the air quality in the Diponegoro University environmental engineering library is 34 CFU/m³ [14-19].

The study’s results to examine the number of bacteria carried out in 2 classrooms at the Darur Abror Foundation obtained the highest germ number index in class B with a colony number of 2,699 CFU/m³ in the morning. The number of bacteria in the corner of the room is relatively more. Because the corner of the room is often not cleaned, many bacteria gather there. It can be a reference that the cleanliness of the room in the classroom must be considered again. It not only sweeps the floor and cleans the table, but also in more detail, such as cleaning the dust in the cupboards and cleaning the room with room cleaners that contain disinfectants or other antibacterial. Most of the bacteria in the room can be removed so that the room becomes healthier and cleaner, the scale and schedule for cleaning the room can be rerouted, as well as optimizing the use of natural ventilation as a means of changing indoor Air so that the room can be healthier [20].

Based on previous research, the number of bacteria in each different room is influenced by several things: microbiologically, with indicators of the number of bacterial colonies in the room. Cleaning the room that needs to be carried out correctly or according to standards will affect the number of bacterial colonies in the room. High humidity will increase the growth of microorganisms. The air quality will be affected if the air temperature is too hot. Lighting in the room should be considered because lighting is also a disinfectant to kill bacteria. The condition of the door is not closed, which can cause contamination from outside.

**Characteristics of Indoor Air Bacteria**

Bacterial colonies were incubated at 370C for 24 hours on the surface of NA (Nutrien Agara) medium in a petri dish. In macroscopic observations on NA medium in a petri dish, including colony size, colony shape, and colony color. Based on the characteristic research according to the size of the bacteria, the highest number is pinpointed. Characteristics according to the shape of bacteria based on the number are Circular. Characteristics according to the color of the bacteria, the highest number is white.

In contrast to the results of the research on bacterial characteristics conducted by Veny [21], the characterization of bacteria according to their size based on their number was Small. The characterization of bacteria according to the shape based on the most numerous is Circular. The characterization of bacteria according to color based on the most numerous is yellow.

**CONCLUSION**

The classrooms studied at the Darur Abror Foundation school; two rooms did not meet the healthy air quality standards based on the Minister of Health Regulation No. 1405/MENKES/SK/2002. The two classrooms at the Darur Abror Foundation obtained a number of colonies, 2,699 CFU/m³.

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