Identification of Bacteria Bacillus sp. as a Decomposer of Organic Contaminants of Domestic Wastewater in Kodingareng Island, Makassar City

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Article Info	Abstract
	BACKGROUND: Water pollution is a condition where waste is dumped carelessly into waters resulting from production activities or human activities. Domestic wastewater is the biggest cause of damage and pollution in coastal areas in Indonesia. AIM: This study aims to identify the presence of Bacillus sp. as a decomposer of organic pollutants in domestic wastewater on Kodingareng Island, Makassar City. METHODS: The type of research used is quantitative observational research with a descriptive approach. The sampling technique uses grab sampling technique. The sample in this study consisted of 6 samples. RESULTS: The research results obtained from the microbiological identification process in domestic wastewater from Kodingareng Island, Makassar City, namely that 5 samples contained Bacillus sp. and 1 sample contained Enterobacter aerogenes. These bacteria are able to decompose organic pollutants and the resulting domestic wastewater pH ranges from 6.0 - 8.2 while the temperature ranges from 26 - 29°C, where this figure is the optimum pH and temperature range for the growth of Bacillus sp bacteria. CONCLUSION: The pH and temperature values of Bacillus sp. in domestic wastewater on Kodingareng Island, Makassar City, it was obtained that it met the optimum pH and temperature values for the bacteria Bacillus sp. Based on the identification results, it was found that the bacteria Bacillus sp. in domestic wastewater on Kodingareng Island, Makassar City.

INTRODUCTION

Water pollution is a condition where waste is dumped haphazardly into waters resulting from production activities or human activities. Sources of water pollution are caused by direct and indirect sources of contaminants. Direct sources are effluent contaminants obtained from industry, landfills, and so on. This is different from indirect sources, which are contaminants that enter water bodies from soil, groundwater, or the atmosphere in the form of rain (1). Water pollution has an impact on reducing water quality. Water that has been polluted, either by organic or inorganic compounds, will easily become a medium for the development of various diseases. This is influenced by human activities which often exploit the environment. Human activities generally produce waste. The increase in population density in Indonesia has an impact on the increasing amount of waste water produced. This is because the increase in population is not accompanied by an increase in area, resulting in a decline in environmental quality (2).

A common environmental problem today is liquid waste produced from household activities or what is commonly referred to as domestic wastewater. Domestic wastewater is wastewater obtained from residents' daily activities, consisting of water used for cooking, water used for bathing, water used for washing, etc (3). Domestic wastewater generally contains organic materials. Domestic wastewater that is directly released from the dump without treatment will result in water pollution. Domestic wastewater is even the biggest cause of damage and pollution in coastal areas in Indonesia (4). Domestic wastewater problems in Indonesia require special attention from the government as the party responsible for providing services to the community. This is because until now Indonesian people still have bad habits regarding waste water management, such as disposing of domestic waste water produced directly into the environment or water bodies such as the sea. Domestic wastewater management is also still minimally implemented in cities spread throughout Indonesia (5).

Makassar City is one of the cities that still has minimal domestic wastewater treatment. This is influenced by several islands in Makassar City, where people still have low awareness of domestic wastewater treatment, one of which is Kodingareng Island. The 2015 Kodingareng Island Village Profile Report explains that

Kodingareng Lompo Island is one of the small islands in Sangkarrang District, Makassar City. Kodingareng Island has an area of 0.48 km2 with a height of less than 500 meters above sea level. The population is 4,522 people consisting of 1173 heads of families. Kodingareng Island, Sangkarang District, continues to experience an increase in population and economic activity every year. This indirectly also has an impact on increasing the amount of domestic wastewater produced. The awareness of the people of Kodingareng Island can be categorized as still low in the area of processing the domestic liquid waste they produce. The public's treatment of domestic wastewater produced is generally channeled directly into the sea without prior processing. This action will directly pollute sea water (6).

Efforts that can be made before liquid waste is discharged into the environment are to first carry out further processing. Waste processing aims to minimize existing waste by reducing the influence of volume, concentration and toxicity of liquid waste by utilizing microorganisms to consume pollutants in the form of organic substances. Utilization of the growth activities of microorganisms in contact with waste, including the process of degrading organic waste. The principle is by converting polluting organic materials into nutrients in a simpler form. One way of processing waste can be done using biological methods which utilize biological agents such as microorganisms to break down the materials contained in waste water. The biological method or biodegradation by microorganisms is one that is precise, effective, and has almost no side effects on the environment. This is because biological methods do not produce toxins (7).

One of the microbes that can be used to degrade organic pollutants found in domestic wastewater is the bacteria Bacillus sp. Bacillus sp. are bacteria that are characterized by being rod-shaped, aerobic, including gram-positive bacteria, and are arranged to form long chains. Bacillus sp. forms spores so that generally Bacillus sp. is saprophytic by using nitrogen and carbon as a source of energy and growth. Spores of Bacillus sp. able to be resistant to environmental changes, resistant to heat, dryness and chemical disinfectants. Bacillus sp. can be found in soil, water and air, as well as in vegetation. These bacteria have the ability to utilize organic materials contained in waste. The method used by Bacillus sp. in degrading waste water, namely by releasing enzymes to break down organic compounds to produce by-products in the form of carbon dioxide (CO_2), methane (CH_4), hydrogen (H_2) and water (H_2O), as well as energy to support metabolic activities (8).

The existence of microbes in the environment is influenced by environmental factors, both biotic and abiotic factors. Biotic factors are living things that are used as nutrients by other living things. This is different from abiotic factors, which are physico-chemical factors such as temperature, degree of acidity (pH), dissolved oxygen (DO) content and light intensity which influence the existence of living things in the aquatic environment. Temperature and pH are important factors in the environment that have a major influence on the activity and evolution of living organisms. Not all temperature and pH levels are suitable for the growth and reproduction of organisms. High and low environmental temperatures and pH have a big influence on organisms, including Bacillus sp. (9). Therefore, researchers are interested in conducting research to find out the presence of Bacillus sp bacteria. as a decomposer of organic pollutants in domestic wastewater on Kodingareng Island, Makassar City.

METHOD

This research uses quantitative research, descriptive laboratory observations. This research was carried out in February - June 2021 in two locations, namely sampling was carried out on Kodingareng Lompo Island, Sangkarrang Islands District, Makassar City and sample examination was carried out at the Bacteriology Laboratory of the D3 Technology Study Program, Medical Laboratory, Muhammadiyah Makassar Health Polytechnic. The population in this study is waste water obtained from households spread across six RWs on Kodingareng Lompo Island, Sangkarrang Islands District, Makassar City. The number of samples in this study were six domestic wastewater samples obtained from each RW on Kodingareng Lompo Island, Sangkarrang Islands District, Makassar City, taking into account the predetermined inclusion criteria, namely wastewater originating from houses that have waste disposal outlets. The sampling technique uses grab sampling technique. Data collection was carried out in two ways, namely primary data obtained directly from the results of laboratory examinations of domestic wastewater on Kodingareng Island, Makassar City and secondary data sourced from related literature such as obtained from searches of libraries, theses, journals, books and from related agencies. related to and supports this research. The data obtained is in the form of data from laboratory examinations which aim to identify the presence of Bacillus sp bacteria. as a decomposer of organic pollutants in domestic wastewater. The analysis technique used in this research is descriptive analysis accompanied by graphic tables and narratives that thoroughly describe the presence of Bacillus sp bacteria. as a decomposer of organic pollutants in domestic wastewater.

RESULTS AND DISCUSSION

Data collection in this research was carried out using observation sheets and laboratory examinations. The data obtained is in the form of laboratory examination results and then analyzed through descriptive analysis accompanied by graphic tables and narratives.

Table 1. Results of checking the pH value of domestic wastewater
on Kodingareng Island, Makassar City

No	Sample Code	pH
1	RW 1	7,9
2	RW 2	6,9
3	RW 3	7,8
4	RW 4	7,7
5	RW 5	7,7
6	RW 6	8,2

Based on table 1, it shows that the results of examining the pH value of domestic wastewater on Kodingareng Island, Makassar City, namely the range of pH values obtained was 6.9 - 8.2. The highest pH was obtained at the RW 6 location while the lowest pH was obtained at the RW 2 location. *Power of Hydrogen* (pH) is the degree of acidity which functions to express the level of acidity or alkalinity of a solution. pH is an important quality parameter for clean water and wastewater. A good pH for biological processes in wastewater is 6 - 9. Based on the results of pH checks on domestic wastewater on Kodingareng Island, Makassar City, the results showed that the pH value in each RW was different. The pH value in RW 1 is 7.9. The pH value of domestic wastewater in RW 2 is 6.9 and RW 3 is 7.8. In contrast, in RW 4 and RW 5, the same pH value for domestic wastewater was obtained, namely 7.7. Finally, the pH value for domestic wastewater in RW 6 is 8.2.

pH conditions affect the types of microbes that grow. Most microbes are influenced by an optimum pH which results in their growth being optimum. Bacteria generally work optimally in the pH range 6 - 8, but some types of microbes can live at a lower pH (*acidhophiles*) or at a higher pH (*alkalophiles*) (10). Bacteria *Bacillus sp.* is a type of mesophilic microbe. Mesophilic microbes include microbes that are able to grow at a pH ranging from 5.5 - 8.0 (11).

Based on this, it can be concluded that the pH of bacteria *Bacillus* sp. In domestic wastewater on Kodingareng Island, Makassar City, the results obtained were 6.9 - 8.2, thus meeting the optimum pH value of *Bacillus* sp. namely 5.5 - 8.0. This research is in line with research conducted by Budiyani et al (2016), namely *Bacillus sp.* examined in production medium with a pH of 7.0 produced the highest antibiotic activity. The high antimicrobial activity produced in a medium with a pH of 7.0 is due to bacteria *Bacillus sp.* Optimum life is at pH 7.0 so that the secondary metabolites produced are optimal (12).

Table 2. Results of checking temperature values in domestic wastewater
on Kodingareng Island, Makassar City

No	Sample Code	Temperature
1	RW 1	26°C
2	RW 2	29°C
3	RW 3	29°C
4	RW 4	27°C
5	RW 5	29°C
6	RW 6	27°C

Based on table 2, it shows that checking the temperature values for domestic wastewater on Kodingareng Island, Makassar City, the range of temperature values obtained is 26 - 29 °C. The highest temperatures were obtained at the RW 2, RW 3, and RW 5 locations, while the lowest temperatures were obtained at the RW 1 location. Temperature is one of the environmental factors that influences the growth and ability of microorganisms to survive. Microbial growth requires a certain temperature range. The temperature range for microbial growth can be categorized into minimum temperature, optimum temperature, and maximum temperature. The minimum temperature is the lowest temperature but still allows microbes to live. Meanwhile, the optimum temperature is the best temperature for the growth of microbes. This is different from the maximum temperature which is the highest temperature for microbial life (12). Bacteria *Bacillus sp.* including mesophilic microbes where this group of microbes is able to live at a temperature range of 25°C to 40°C with an optimum temperature range of 25°C to 37° C (13).

Based on the results of examining the temperature values of domestic wastewater on Kodingareng Island, Makassar City, it was found that several domestic wastewater temperature values in each RW had the

same temperature. The domestic wastewater temperature value in RW 1 is 26ºC. The temperature value for domestic wastewater in RW 2, RW 3 and RW 5 is the same, namely 29ºC. Likewise, RW 4 and RW 6 have the same domestic wastewater temperature value, namely 27ºC. Based on the results obtained, it can be concluded that the bacterial temperature *Bacillus* sp. in domestic wastewater on Kodingareng Island, Makassar City, the obtained value is 26 - 29ºC so that it meets the optimum temperature value of *Bacillus* sp. namely 25ºC to 37º C.

Table 3. Results of Domestic Wastewater Bacterial Growth
Kodingareng Island, Makassar City on BHIB Media

No	Sample Code	Media BHIB	Results
1	RW 1	turbidity occurs	+
2	RW 2	turbidity occurs	+
3	RW 3	turbidity occurs	+
4	RW 4	turbidity occurs	+
5	RW 5	turbidity occurs	+
6	RW 6	turbidity occurs	+

Based on table 3, it shows that by examining the bacterial growth of domestic wastewater from Kodingareng Island, Makassar City on BHIB media, the results showed that all domestic wastewater samples that had been planted on BHIB media experienced bacterial growth which was characterized by turbidity. BHIB functions as a fertilizer medium to optimize bacterial growth. The results obtained were turbidity in all samples which indicated bacterial growth.

Table 4. Results of bacterial growth in domestic wastewater on Kodingareng Island
Makassar City on EMBA media

No	Code Sample	Colony characteristics on Half EMBA	Results	Interpretation Results
1	RW 1	reddish pink colonies, large colony	+	Indicates presence bacterial growth
2	RW 2	reddish pink colonies, large colony	+	Indicates presence bacterial growth
3	RW 3	reddish pink colonies, large colonies	+	Indicates bacterial growth
4	RW 4	reddish pink colonies, large colony	+	Indicates presence bacterial growth
5	RW 5	reddish pink colonies, large colony	+	Indicates presence bacterial growth
6	RW 6	reddish pink colonies, large colony	+	Indicates presence bacterial growth

Based on table 4, it shows that by examining the bacterial growth of domestic wastewater from Kodingareng Island, Makassar City on EMBA media, the results showed that all domestic wastewater samples that had been planted on EMBA media indicated bacterial growth. The characteristics of bacterial colonies found in observations on EMBA media are that bacterial colonies are reddish pink in color and have large colony sizes. EMBA media is a selective media that functions to select colonies of one type of bacteria from other colonies. Colonies that previously grew on BHIB media were then transferred to EMBA media using a sterile tube and then incubated for 24 hours at a temperature of 37ºC. Results on EMBA media for type *Bacillus* It can be said to be positive if it shows the characteristics of a reddish pink colony and a large colony size. After incubation and observation of the culture, large colonies were found to be pink (reddish pink) so it could be concluded that the results of these observations indicated the presence of colony growth. *Bacillus sp.*

Table 5. Results of identification of domestic wastewater bacteria
Kodingareng Island, Makassar City on biochemical test media

Sample	Base	TSIA	SCA	SIM	MR	VP	

		Slope	Gas	H2S		Sul	Ind	Moti			Type Bacteria
RW 1	Sour	Sour	-	-	+	+	-	+	-	-	*Bacillus* sp.
RW 2	Sour	Sour	-	-	+	+	-	+	-	-	*Bacillus* sp.
RW 3	Sour	Sour	-	-	+	+	-	+	-	-	*Bacillus* sp.
RW 4	Sour	Sour	+	-	+	+	+	+	+	+	*Enterobacter aerogenes*
RW 5	Sour	Sour	-	+/-	+	+	-	+	-	-	*Bacillus* sp.
RW 6	Sour	Sour	-	+/-	+	+	-	+	-	-	*Bacillus* sp.

Based on table 5, it shows that by examining the growth of domestic wastewater bacteria from Kodingareng Island, Makassar City on biochemical test media, the results showed that of all domestic wastewater samples there were 5 samples containing bacteria. *Bacillus* sp. and 1 sample contained bacteria *Enterobacter aerogenes.* In this biochemical test, there are several stages, namely the TSIA test, SCA test, SIM test, MR test and VP test. The first test carried out is the TSIA test. The TSIA test is carried out with the aim of distinguishing bacteria based on their ability to produce gas and H_2S. The color changes that occur in the TSIA medium after incubation are the yellow medium color indicating acid, the red medium color indicating alkaline, and the base color of the medium turning black indicating the formation of H_2S, and if the medium is lifted, it indicates that the microbes are capable of producing gas (14).

The results obtained from the TSIA media examination, the results obtained for samples RW 1, RW 2, RW 3, RW 4, RW 5, and RW 6 at the base and slopes were acidic (yellow). This happens because bacteria are able to ferment lactose or sucrose. The gas results in RW 1, RW 2, RW 3, RW 5, and RW 6 are negative gas (-) due to the absence of fractions in the media, while the gas results in RW 4 are positive gas (+) due to the presence of fractions in the media. Positive gas (+) This gas formation is the result of fermentation of H2 and CO2 which can be seen from the rupture and lifting of the media. Judging from the H2S results, RW 1, RW 2, RW 3, and RW 4 are negative (-) H2S. This indicates that the bacteria are unable to desulphurize amino acids. Meanwhile, the results from RW 5 and RW 6 are positive H_2S (+)/negative H2S (-). Positive H_2S (+) is marked by the presence of a black precipitate and can decompose amino acids that contain sulfur. Based on research conducted by Santosa and Retnaningrum (2020), the results showed that the TSIA test was negative (-), indicated by the absence of black precipitate formed at the bottom of the TSIA media, which is a sign that bacteria cannot produce H_2S (15).

The second test in a series of biochemical tests is the SCA test. The SCA test was carried out to detect the ability of bacteria to use citrate as a sole carbon and energy source. The provisions of the SCA test are that inoculation of isolates is carried out on SCA slanted medium using the zig-zag scratch method on the slant and a prick at the base. The changes that occur in this test are that a positive test is marked by a change in the color of the media to blue, while a negative test is marked by no change in color of the media (16). The observation results obtained from biochemical tests on SCA media were that all samples were positive (+). This is characterized by a color change from green to blue, indicating that the bacteria are able to grow using citrate as the only carbon source. Nur et al (2022) explained that the color change that occurred in Simmons's Citrate Agar medium from green to blue was caused by an increase in the pH of the medium (17).

The next biochemical test is the SIM test. SIM media is a semi-solid media that is cream colored. The inoculation mechanism for bacterial isolates into SIM medium must be upright by piercing. The SIM test results can be seen with a positive (motile) test, characterized by migration (movement) in the media which causes the media to become cloudy (turbid). Negative test results (non-motile) can be indicated by growth that occurs only visible along the inoculation line and the media does not become cloudy (18). The next step is that a few drops of Kovacks compound are added to the isolate to see the production of indole compounds. Positive results for indole are indicated by the formation of a red ring (14).

Based on observations made on SIM media, the results were obtained that all samples produced positive (+) sulfur. This is indicated by the presence of black color on the puncture mark. This is different from the results found for indole, namely that there was one sample that had positive (+) indole, namely sample RW 4 and the rest had negative (-) indole. Negative indole (-) indicates that the bacteria do not use tryptophan as an energy source so the bacteria are unable to produce indole. Finally, in terms of motility results, the results showed that all samples produced positive (+) motility. Positive motility (+) is indicated by the movement of germs because bacteria use the amino acid tryptophan as a carbon source.

Research conducted by Fachrial (2022) illustrates that the results of the motility test show that there is movement of bacterial cells using a movement aid in bacterial isolates, namely the flagellum. The motile nature

is influenced by the presence of a flagellum in the bacteria which becomes a means of movement for the whip so that the bacterial cells can swim in the water environment (19). Motility in most types of motile bacteria occurs at relatively low temperatures, namely 15 - 25° C and can become non-motile above 37 ° C.19 According to Santosa and Retnaningrum (2020) the indole test is negative (-) indicated by the dissolution of the amino compound benzealaldehyde in water. This results in the formation of a red ring-like color as indole is formed (15). Based on research conducted by Fachrial (2022), the indole test has a positive reaction marked by the formation of a red ring layer. Bacteria that show a positive reaction (+) in the indole test indicate that the bacteria are capable of producing the enzyme tryptophanase. This causes bacteria to be able to oxidize the amino acid tryptophan to form indole (19).

Furthermore, for the MR test, the results obtained from the observation process on the MR media for samples RW 1, RW 2, RW 3, RW 5, and RW 6 were MR negative (-) while the MR results on RW 4 were MR positive (+). Positive MR (+) can occur if bacteria are able to oxidize glucose by producing high concentrations of acid as the end result. The results obtained from the observation process on the VP media for the RW 1, RW 2, RW 3, RW 5, and RW 6 samples were negative VP (-) while the VP results in RW 4 were positive MR (+). On negative VP media (-), that is, no purple rings are formed because the bacteria do not use acetyl-methylcarbinol (acetoin) as a source of protein.

Research conducted by Pan and Cai (2023) obtained the following results *Bacillus sp.* is one of the microbes that has the ability to dissolve phosphate minerals through the secretion of organic acids and involving the enzyme phosphatase. *Bacillus sp.* It also plays a role in transferring energy, constructing proteins, coenzymes, nucleic acids and other metabolic compounds. This is what resulted *Bacillus sp.* can increase protein absorption activity in plants (20). Based on research conducted by Ladole et al., (2020), the results showed that extracellular ligninolytic enzymes found in *Bacillus sp.* plays an important role in the detoxification process of various organic compounds in which nutrition plays a very important role (21). *Bacillus sp.* including the PGPB group which is very good at synthesizing *siderophore*, IAA, phosphate solvents, and ACC deaminase even under metal stress (22). *Bacillus sp.* also includes rhizobacteria genera which can be the most widely reported plant growth promoters. Strains of *Bacillus sp.* It can be used effectively in the ability to regulate plant diseases and promote plant growth (23).

Enterobacter aerogenes is a gram-negative bacteria belonging to the family *Enterobacteriaceae*. *E. aerogenes* including bacteria *coliform non-fecal* namely bacteria *coliform* found in dead animals or plants. Bacteria *E. aerogenes* It is facultatively anaerobic, cocci-shaped, does not have spores, and has a means of locomotion in the form of flagella that are evenly distributed throughout the cell surface. *E. aerogenes* are microbes that can be found in the surrounding environment, such as soil, plants, waste and water. *E. aerogenes* has the ability to ferment glucose by producing acid and gas, reducing nitrate to nitrite, forming acetate, capsules and citrate which are used as the only carbon source. These bacteria also produce acetoin and produce indole (24). Bacteria *E. aerogenes* has the ability to cause disease in human body tissue. *E. aerogenes* In fact, it has an important role in nosocomial infections, for example as a cause of urinary tract infections, wound infections and other infections (25).

Table 6. Results of Examination of the Number of Bacterial Colonies *Bacillus* sp. on Domestic Wastewater on Kodingareng Island, Makassar City

Sample	Dilution		Number of Colonies
	10^{-3}	10^{-4}	
RW 1	43	26	$15{,}15 \times 10^4$ CFU/ml
RW 2	35	22	$14{,}25 \times 10^4$ CFU/ml
RW 3	42	26	$15{,}10 \times 10^4$ CFU/ml
RW 4	36	20	$14{,}30 \times 10^4$ CFU/ml
RW 5	48	28	$16{,}40 \times 10^4$ CFU/ml
RW 6	39	25	$14{,}45 \times 10^4$ CFU/ml

Examination of the number of bacterial colonies in domestic wastewater on Kodingareng Island, Makassar City was carried out through the dilution stage. Dilution was carried out four times (10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}) i.e. a sample in the form of a mixture is taken and inserted continuously from tube to tube until the fourth dilution has previously been filled with 9 ml of NaCl. Based on the table of observation results for the number of colonies in domestic wastewater samples on Kodingareng Island, Makassar City, the results obtained in RW 1 in the third dilution (10^{-3}) and fourth (10^{-4}) respectively are 43 colonies and 23 colonies. RW 2 in the third dilution (10^{-3}) and fourth (10^{-4}) respectively are 35 colonies and 22 colonies. RW 3 in the third dilution (10^{-3})

and fourth (10^{-4}) respectively are 42 colonies and 26 colonies. RW 4 in the third dilution (10^{-3}) and fourth (10^{-4}) respectively are 36 colonies and 20 colonies. RW 5 in the third dilution (10^{-3}) and fourth (10^{-4}) respectively are 48 colonies and 28 colonies. RW 6 in the third dilution (10^{-3}) and fourth (10^{-4}) are 39 colonies and 25 colonies respectively. The cup results from the third dilution were higher than the results from the fourth dilution.

The results of calculating domestic wastewater samples on Kodingareng Island, Makassar City using the method *Standard Plate Count* (SPC), the results obtained in RW 1 were 15.15×10^4CFU/ml, RW 2 was 14.25×10^4CFU/ml, RW 3 was 15.10×10^4CFU/ml, RW 4 was 14.30×10^4CFU/ml, RW 5 yaitu $16,40 \times 10^4$CFU/ml, and RW 6 was 14.45×10^4CFU/ml. Metode *Standar Plate Count* (SPC) can be one of the methods used to calculate the number of microbes contained in wastewater samples. Based on the results above, it can be concluded that the results of examining the number of bacterial colonies in domestic wastewater from Kodingareng Island, Makassar City, namely that the highest number of colonies was found in the RW 5 sample, namely 16.40×10^4CFU/ml. The lowest number of colonies was found in the RW 2 sample, namely 14.25×10^4CFU/ml.

CONCLUSION

Based on the results of research regarding bacterial identification *Bacillus* sp. as a decomposer of organic pollutants in domestic wastewater on Kodingareng Island, Makassar City. In 2021, the results showed that the pH value of bacteria *Bacillus* sp. in domestic wastewater on Kodingareng Island, Makassar City, the results obtained met the optimum pH value of bacteria *Bacillus* sp. Bacterial temperature value *Bacillus* sp. in domestic wastewater on Kodingareng Island, Makassar City, the results obtained met the optimum temperature value for bacteria *Bacillus* sp. Bacterial identification results *Bacillus* sp. in domestic wastewater on Kodingareng Island, Makassar City, which was obtained from 6 samples that had been tested, it was stated that 5 samples contained *Bacillus* sp. and 1 sample contains *Enterobacter aerogenes*. The advice that can be given is the need for further testing and analysis of bacterial isolates *Bacillus sp.* which have been identified. This is intended to *Bacillus sp.* can be developed into one of the bacteria that decomposes domestic wastewater so that it can reduce environmental pollution.

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