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Test of Bamboo Leaf Bacterial Potential on the Growth and Yield of Shallot Plants (*Allium ascalonicum* L.)

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Abstract

This research was carried out at the Laboratory of the Department of Agrotechnology, Faculty of Agriculture, Gorontalo State University and at the Green House of the Gorontalo Agricultural Assembly and Modernization Agency from December 2024 to April 2025. This study aims to determine the effect of soaking onion bulbs with bamboo leaf bacterial isolate on the growth and yield of shallot plants and to obtain bamboo leaf bacterial isolate that has the potential to affect the growth and yield of shallot plants. The study was designed using a Random Design Group (RDG) with a suspension treatment of bamboo leaf bacterial isolates consisting of seven types of bacterial isolates that have not yet been identified, namely, X1, X2, X3, X4, X5, X6, X7, and X0 as controls (without bacterial suspension). The parameters measured were plant height, number of leaves, number of seedlings, number of bulbs, weight of wet bulbs, and weight of dry bulbs. The observation data was analyzed using Analysis of Variance (ANOVA α = 5%), and if the results were significantly different, DMRT was further tested at the level of 5%. The results showed that the X2 bacterial isolate suspension treatment had a real effect on the number of seedlings, and had a good influence on the parameters of the number of bulbs and the weight of dry bulbs.

Keyword: Shallots, bamboo leaf bacteria, suspension.

INTRODUCTION

Shallots (*Allium ascalonicum* L.) is one of the horticultural plants that is widely cultivated. This plant has various benefits, namely as a complement to kitchen spices because of its distinctive aroma and strong taste, and functions as an ingredient in traditional medicine. In

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addition, the onion plant contains a variety of nutrients needed by the human body, such as protein, carbohydrates, fatty acids, sugars, and other minerals. Shallots are classified as a vegetable commodity that offers promising economic benefits and has wide market prospects, so this plant deserves to be used as a national flagship crop (Husain et al., 2022). The demand for shallots continues to increase along with the increase in population and the need for daily consumption of shallots, but this increase is not offset by the rate of shallot production every year.

According to the Central Statistics Agency, shallot production in Gorontalo Province has fluctuated from 2019-2023. In 2019, shallot production in Gorontalo Province was recorded at 629 tons, then in 2020 it decreased to 476 tons, and again decreased to 346 tons in 2021. Despite this, shallot production increased to 418 tons in 2022, but in 2023 it decreased again to reach 237 tons. Shallot production nationally also experienced unstable production during the period 2021 to 2023. In 2021, national production was recorded at 2,004,590 tons, then decreased to 1,982,360 tons in 2022, and in 2023 it increased to 1,985,233 tons (BPS., 2023). The instability of shallot production is influenced by various factors, one of which is the low availability of nutrients in the soil which acts as an important source of nutrients for plant growth and development.

The production of shallot plants can be increased through organic farming programs with a biological approach. The biological approach can be applied in several ways, one of which is the use of microorganisms such as bacteria, fungi, nematodes, and other microorganisms. Microorganisms play an important role in stimulating plant growth, optimizing nutrients and water, controlling plant pests and diseases, degrading phosphates in the soil, accelerating the composting process, and binding nitrogen from the atmosphere into ammonia and nitrate ion compounds (Pusvita et al., 2024). Microorganisms that are beneficial to plants can be utilized both from the soil and those found in plants. One of the plants that contains a lot of microorganisms that play a role in increasing plant growth is bamboo plants. Bamboo plants have the potential to be a source of microorganisms that can support plant growth naturally and environmentally friendly.

Bamboo plants (*Poaceae*) are a type of large grass known as giant grass which has the potential to be used in various fields. One of the parts of bamboo plants that has great potential to be used is the leaves. However, until now, bamboo leaves are still often considered waste and have not been utilized optimally. In fact, bamboo leaves contain various bioactive compounds that have the potential to provide benefits, one of which is in supporting plant growth. This potential can be harnessed through the role of microorganisms found on the

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surface and tissue of bamboo leaves.

Research shows that bamboo leaves contain high macronutrients such as potassium (K) of 12.17 mg/g, calcium (Ca) 5.37 mg/g, and magnesium (Mg) 388.76 mg/g (Sigit et al., 2014). The phosphorus (P) content of 0.74% and potassium (K) of 0.91% makes bamboo leaves potential as organic materials to improve soil structure and support the growth of horticultural plants such as shallots (Rusdi et al., 2019). The silica element (Si) contained in bamboo leaves functions to strengthen the stem structure and increase the resistance of plants to environmental stresses (Wibowo et al., 2020).

Bamboo leaf litter also contains microorganisms that can be utilized as biodecomposer agents, such as *Aspergillus* sp. *Saccharomyces cerevisiae,* and *Lactobacillus* sp. This group of microorganisms plays a role in stimulating plant resistance to pathogens and pests, producing antibiotic compounds, and competing with other microbes in the fight for nutrients (Beneduzi et al., 2012). *Saccharomyces cerevisiae* it is specifically known as microbes that are capable of supporting plant growth and resistance to various abiotic stresses such as drought, salinity, and extreme temperatures (Sa'adah., 2018).

Several studies related to the use of bacteria in increasing crop production have shown significant results. Pratama., (2023) identify that the use of bacteria *Bacillus* sp. can produce high-quality seeds, which contributes to increased production of peanut crops. Research by Novatriana & Hariyono., (2020) shows that Plant Growth Promoting Rhizobacteria (PGPR) can effectively improve the growth and yield of onion plants through a 30-minute soaking treatment of onion bulbs, which is proven to improve growth parameters such as plant height, number of leaves, leaf area, fresh weight, dry weight, number of bulbs, and diameter of bulbs.

Based on the description above, the researcher is interested in using bamboo leaves with the aim of determining the effect of soaking shallot bulbs with bamboo leaf bacterial isolate on The growth and yield of shallot plants and to obtain bamboo leaf bacterial isolate that has The potential for the growth and yield of shallot plants.

METHOD

Place and time

This research was carried out at the Laboratory of the Department of Agrotechnology, Faculty of Agriculture, Gorontalo State University and at the Green House of the Gorontalo Agricultural Assembly and Modernization Agency from December 2024 to April 2025.

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Tools and materials

The tools used in this study are Laminar Air Flor (LAF), handskun, scissors, dental tweezers, bunsen, petri dish, sterile wipes, plastic wrap, paper, incubator, analytical scales, small cups, spoons, teapots, glass spatulas, pots, stoves, erlenmeyer, cotton, aluminum foil, ose needles, autoclaves, labels, heat-resistant plastic, shaker incubators, microscopes, rubber, jars, buckets with a diameter of 20 cm, shovels, hoes, scales, knives, meters, stationery, mobile phones. The materials used are bamboo leaves, alcohol, sterile water, aquades, Nutrient Agar (NA), cotton, Nutrient Broth (NB), bamboo leaf bacterial suspension, sugar, onion seeds, cow manure, burnt husks, soil, water.

RESEARCH METHODS

This study used a Group Random Design with a suspension treatment of bamboo leaf bacterial isolates consisting of seven types of bacterial isolates that have not been identified and one treatment without a suspension of bacterial isolates as a control. The treatments are X1 Bacterial Isolate (BDBX1), X2 Bacterial Isolate (BDBX2), X3 Bacterial Isolate (BDBX3), X4 Bacterial Isolate (BDBX4), X5 Bacterial Isolate (BDBX5), X6 Bacterial Isolate (BDBX6), X7 Bacterial Isolate (BDBX7) and Control (X0). Each treatment was repeated three times for a total of 24 experimental units. Each experimental unit was planted with 3 shallot bulbs that had been soaked in each bamboo leaf bacterial isolate treatment for 30 minutes.

The research is carried out in the laboratory and in the field, the stages carried out are:

In the Laboratory

1. Bamboo leaf sample

   Bamboo leaf samples The bamboo leaf samples used in this study came from bamboo leaf litter or leaves that had fallen on the ground, which were collected from gardens around the Faculty of Agriculture, Gorontalo State University. Bamboo leaf samples are stored in plastic containers for microbial isolation purposes at the Laboratory of the Department of Agrotechnology.

2. Sterilization of the appliance

   The tools used such as erlenmeyer, petri dish, dental tweezers, and others were sterilized using an autoclave with a temperature of 121^{o}C, a pressure of 115 kilopascals (Kpa), for 30 minutes.

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3. Manufacture of bacterial growth media

   Bacterial growth medium is a mixture of substances that contain nutrients and nutrients used to grow bacteria. This medium contains peptone and meat extract as a source of nitrogen, as well as carbohydrates, mineral salts, vitamins, and other growth factors that microorganisms need as their food. In this study, NA and NB solid media were used

4. Sterilization and isolation of bamboo leaves

   The sterilization process of bamboo leaves is carried out in Laminar Air Flow. The leaves are cut into small pieces ± 1 cm - 1.5 cm, then sterilized in 70% alcohol for 2 minutes, followed by washing using sterile water, and dried with sterile tissue. After sterilization, the leaf samples are grown on NA in a petri dish and incubated in an incubator at 36°C for 1 week to isolate and obtain pure bacterial colonies.

5. Purification

   The purification of the isolates is carried out to obtain pure cultures from bacterial colonies that have been previously isolated. This purification process is carried out by replanting each bacterial isolate in a solid NA medium using the T scratch method (Quadrant I, II, III), and repeated three times to ensure purity. It is then incubated in an incubator at 36°C for 1 week to obtain separate colonies which are pure cultures of each isolate.

6. Bacterial propagation in NB media

   Bacterial propagation was carried out in liquid NB media using pure isolate resulting from the third purification. A small amount of bacteria from each isolate was transferred using an ose needle into the erlenmeyer containing NB media. Erlenmeyer was then closed, *wrapped*, and incubated in a shaker incubator at 37°C at a speed of 80 revolutions per minute (RPM) for 1 week. The resulting liquid culture is the main material that is ready to be used for soaking application solutions.

On the Field

1. Preparation of tools, materials and manufacture of shallot planting media

   The tools used in making planting media are buckets with a diameter of 20 cm (already perforated), scopes, scales, while the materials are onion tubers, soil, cow manure, and burnt husks. Plant media is made by mixing soil media, cow manure and burnt husks in a ratio of 2:1:1. Media is put into a bucket of 2.5 kg of planting media.

2. Manufacture of bacterial suspensions for immersion applications

   Bacterial suspension is prepared by mixing sterile water, bacterial isolate and granulated sugar in sterile jars. Sterile water as much as 455 ml, mixed with 5 ml (1%) bacterial culture

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and 3% (15 g/ 0.5 L media) granulated sugar. The mixture is stirred until evenly distributed and incubated (fermented) for 24 hours in a shaded, dark place. After the fermentation process is complete, the bacterial suspension solution is ready to be used as a soaking treatment for onion bulbs.

3. Soaking onion bulbs

   The onion bulbs are soaked in each of the water treatment solution of 9 onion bulbs for 30 minutes and the onion bulbs are ready to be planted.

4. Planting

   Planting of onion bulbs is carried out after cutting off the top third of the bulb to stimulate buds. Each tuber is then planted into a bucket filled with planting media, with the position of the tubers flush with the surface of the medium, where each bucket is planted with 3 tubers.

5. Plant Maintenance

   Plant maintenance includes watering and weeding. Watering is adjusted to the water needs of the planting medium, which is calculated based on the water retained in the medium (field capacity). Weeding must be carried out to avoid weed competition for nutrients, water, and sunlight with onion plants.

6. Observation

   Observation of shallot plants begins when the plant is 14 Day After Planting (DAP), to 7 Day After Harvest (DAH).

7. Harvest

   Shallot plants are harvested at the age of 65 DAP, with the characteristics of yellowing leaves, the base of the leaves starting to collapse, and tubers that appear to appear on the ground surface.

RESULTS AND DISCUSSION

Isolation and Morphological Observation of Bamboo Leaf Bacteria

Based on the results of bamboo leaf isolation, 7 bacterial isolates were obtained. The following is a picture of the results of bamboo leaf bacterial isolate (Figure 1) and the morphological characteristics of bamboo leaf bacterial isolate macroscopically (Table 1).

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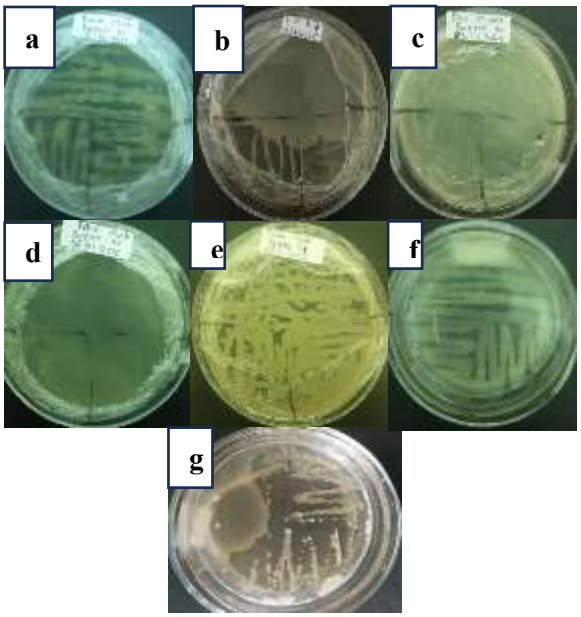


Figure 1. Morphology of Bamboo Leaf Bacteria in NA Media

Ket : a = Bacterial isolate X1 (BDBX1), b = Bacterial isolate X2 (BDBX2), c = Bacterial isolate X3 (BDBX3),
d = X4 bacterial isolate (BDBX4), e = X5 bacterial isolate (BDBX5), f = X6 bacterial isolate (BDBX6),
g = Bacterial isolate X7 (BDBX7)

Table 1. Morphological Characteristics of Bamboo Leaf Bacterial Isolate Macroscopically

NO	Isolates	Morphology			
		Shape	Color	Edge	Elevation
1	BDBX1	round	Yellowish beige	Jagged	Flat
2	BDBX2	Round and creeping	Beige white	Flat	Flat
3	BDBX3	Round	Beige white	Flat	Flat
4	BDBX4	Round	Milky white	Flat	Flat
5	BDBX5	Round	Beige white	Jagged	Flat
6	BDBX6	Irregular rounds	Beige white	Jagged	Flat
7	BDBX7	Irregular rounds	Beige White	Flat	Flat

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The results of the morphological observation of bamboo leaf bacterial isolates carried out macroscopically are presented in Figure 1 and Table 1, Identification of bacterial isolates is carried out based on morphological characteristics macroscopically, namely by looking at shape, color, edges and elevation. Table 1, shows the morphological observation of bamboo leaf bacterial isolates, where the observation results show that the isolates have a round, round and creeping shape, and irregular round, yellowish-beige color, beige white and milky white, serrated and flat edges, and have a flat elevation.

Shallot Plant Height

Based on the results of the variegated analysis on the height of the onion plant, it was shown that the administration of bamboo leaf bacterial isolate treatment on the height of the onion plant at the age of 14, 28, 42 days after planting (DAP) had an unreal effect. The average height value of shallot plants from the results of soaking bamboo leaf bacterial isolate can be seen in Table 2.

Table 2. Average height of shallot plants (cm)

Treatment	Average Plant Height (cm)		
	14 DAP	28 DAP	42 DAP
X0 (Control)	12.71	25.16	24.82
BDBX1	15.81	28.51	32.47
BDBX2	7.93	26.20	30.88
BDBX3	12.52	32.47	35.44
BDBX4	14.47	31.48	33.38
BDBX5	13.81	29.21	30.26
BDBX6	7.03	30.50	33.77
BDBX7	12.36	28.12	32.89

Based on the data in Table 2, the average height of shallot plants treated with several types of bamboo leaf bacteria increased from 14 DAP, 28 DAP and 42 DAP compared to controls. The treatment with BDBX3 isolate showed the highest plant height of 35.44 cm, and BDBX6 isolate with a plant height of 33.37 cm and the control treatment (X0) showed the lowest plant at 24.82 cm at 42 DAP. Some treatments such as BDBX6 isolate and BDBX2 isolate treatment showed lower plant height initially than controls, but improved at 28 DAP and 42 DAP observations. The results of the observations in Table 2 show that treatment with bamboo leaf bacteria provides better plant height growth compared to control (X0). This shows that bamboo

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leaf bacteria are able to increase the physiological activity of plants, such as nutrient absorption and cell division. Rhizoferous microorganisms are able to induce the production of auxin and gibberellin phytohormones that play a role in the activity of plant physiological processes through the stimulation of cell division and lengthening, thereby increasing stem growth and leaf tissue expansion (Chen et al., 2024).

Number of Leaves of the Shallot Plant

Based on the results of the variety analysis on the number of leaves of shallot plants, it was shown that the administration of bamboo leaf bacterial isolate treatment on the number of leaves of shallot plants at the age of 14, 28, 42 DAP had an unreal effect. The average value of the number of leaves of shallot plants from the results of soaking bamboo leaf bacterial isolate can be seen in Table 3.

Table 3. Average number of leaves of a shallot plant (strands)

Treatment	Average Number of Leaves (Strands)		
	14 DAP	28 DAP	42 DAP
X0 (Control)	9.67	20.11	21.67
BDBX1	14.67	30.22	28.22
BDBX2	7.78	22.00	27.44
BDBX3	12.22	27.56	28.44
BDBX4	14.89	27.78	26.22
BDBX5	13.33	23.33	22.67
BDBX6	10.11	26.33	26.56
BDBX7	11.89	24.89	31.89

Based on the data in Table 3, the average number of leaves of shallot plants treated with several types of bamboo leaf bacteria showed an increase of 14 DAP, 28 DAP and 42 DAP compared to controls. The treatment with BDBX7 isolate produced the highest number of leaves at 31.89 leaves and BDBX3 isolate with the number of leaves at 28.44 leaves and the control treatment (X0) showed the lowest number of leaves at 21.67 leaves at the age of 42 DAP. The number of leaves tends to increase as the plant ages. Treatment with bacterial isolates was able to stimulate the formation of more leaves than controls (X0). This is due to the increasing availability of macronutrients, especially nitrogen, which plays an important role in the leaf

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formation process. The bacteria found in bamboo are able to produce phytohormones such as auxin, cytokinin and gibberellin. The activity of these hormones can stimulate the formation of new organs, accelerate leaf growth, and increase the number of leaf blades in onion plants (Kania & Dawan., 2018). Some treatments such as BDBX1 isolates and BDBX4 isolates initially produce a large number of leaves at age 28 DAP but decline at age 42 DAP. As the plant ages, the leaves that have reached an advanced phase begin to lose their function. This decline occurs due to the natural aging process that makes the leaf tissue dry out and then fall off so that the number of leaves is decreasing.

Number of seedlings of shallot plants

Based on the results of various fingerprints on the number of seedlings of shallot plants, it was shown that the treatment of bamboo leaf bacterial isolate had no real effect at the age of 14 DAP, but the treatment began to have a real effect at the age of 28 DAP and 42 DAP. The average value of the number of leaves of shallot plants from the results of soaking bamboo leaf bacterial isolate can be seen in Table 4.

Table 4. Average number of seedlings of onion plants

Treatment	Average number of seedlings		
	14 DAP	28 DAP	14 DAP
X0 (Control)	3.78	5.67 ab	6.33 ab
BDBX1	4.56	8.89 a	11.11 a
BDBX2	2.33	6.67 ab	8.56 ab
BDBX3	3.89	7.78 a	9.67 a
BDBX4	5.11	7.89 a	9.78 a
BDBX5	4.22	7.33 a	7.67 ab
BDBX6	3.11	7.67 a	8.33 ab
BDBX7	3.56	6.44 ab	8.44 ab

Remarks: Numbers followed by different letters in the same column show a noticeable difference on the 5% DMRT test.

Based on Table 4, the number of seedlings of onion plants shows a progressive increase as the plant ages in all treatments. In 14 DAP, BDBX4 isolate produced the highest number of seedlings, which was 5.11 seedlings, while the lowest number was found in BDBX2, which was 2.33 seedlings. At the age of 28 DAP, there was a significant increase in the number of children in the treatment of BDBX1, namely 8.89 children, BDBX3 7.78 children, and BDBX4 which was

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4.89 children. The results of the 5% DMRT test showed that the three treatments were significantly different from the control which only produced 5.67 chicks. At the age of 42 DAP, BDBX1 treatment still showed the highest value of 11.11 seedlings, then BDBX4 treatment 9.78 seedlings, and BDBX3 treatment was 9.67 seedlings. Meanwhile, the control treatment (X0) produced the lowest number of seedlings, which was 6.33 seedlings. The test results showed that the treatment of bamboo leaf isolate bacteria provided a higher number of saplings than the control. This is due to the activity of bacteria that act as a growth promoter that lives around the roots and is able to increase plant growth through various physiological and biochemical mechanisms. Bacteria in bamboo leaves are known to be able to produce phytohormonal compounds such as Indole-3-acetic acid (IAA), cytokinin, and gibberellin which play a role in colonizing plant roots, stimulating cell division and enlargement processes, and triggering the formation of lateral shoots that contribute to increasing the number of saplings in plants (Noor & Melani., 2022).

Number of Bulbs of Shallot Plants

Based on the results of the variety analysis of the number of shallot plant bulbs, it was shown that the administration of bamboo leaf bacterial isolate treatment did not have a significant effect on the age of 65 DAP. The average number of shallot plant bulbs as a result of soaking treatment with bamboo leaf bacterial isolate is presented in Table 5.

Table 5. Average number of bulbs of shallot plants

Treatment	Average Number of Bulbs
	65 DAP
X0 (Control)	8.33
BDBX1	7.67
BDBX2	11.56
BDBX3	10.33
BDBX4	10.44
BDBX5	7.89
BDBX6	11.33
BDBX7	9.22

Based on Table 5, the treatment of bamboo leaf bacterial isolates, in terms of variety, has no real effect. However, in the number of bulbs of onion plants, the BDBX2 isolation

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treatment showed the highest number of bulbs, namely 11.56 bulbs, followed by BDBX6 isolate treatment, which was 11.33 bulbs. Meanwhile, the BDBX1 isolate treatment showed the lowest number of bulbs at 7.67 bulbs and the control (X0) yielded 8.33 bulbs. In general, it can be seen that the administration of bamboo leaf bacterial isolate treatment on shallot plants is able to increase the number of bulbs compared to the control (X0). This is because the treatment has a positive effect on the growth and formation of shallot bulbs. Bacteria *Bacillus* produces the enzyme phosphomonoesterase (PMEase) which plays a role in dissolving phosphate bound to Fe-P and Al-P compounds, so that phosphate becomes available and can be absorbed by plants to support the formation of onion bulbs (Widawati., 2015). The element phosphorus (P) functions to accelerate root growth, tuber or seed formation, and increase tuber yields (Aini et al., 2022).

Weight of Wet Tubers of Onion Plants

Based on the results of various results on the weight of wet bulbs of shallot plants, it was shown that the administration of bamboo leaf bacterial isolate treatment had an unreal effect on shallot plants at the age of 65 DAP. The average value of wet bulb weight of shallot plants from the results of soaking bamboo leaf bacterial isolate can be seen in Table 6.

Table 6. Average weight of wet bulbs of onion plants (grams)

Treatment	Average Weight of Wet bulbs (grams)
	65 DAP
X0 (Control)	21.56
BDBX1	14.20
BDBX2	29.07
BDBX3	29.74
BDBX4	25.84
BDBX5	16.23
BDBX6	31.86
BDBX7	23.54

Based on Table 6, the average weight of shallot wet bulbs treated with bamboo leaf isolate bacteria, The observation results show that BDBX6 treatment produces the highest wet tuber weight, which is 31.86 grams, while BDBX1 treatment produces the lowest weight of 14.20 grams. The control treatment (X0) had a wet tuber weight of 21.56 grams, which was in the

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intermediate position compared to the other treatments. Overall, it can be concluded that the treatment given causes a variety of influences on the growth of wet onion bulbs. Some treatments, such as BDBX2, BDBX3, and BDBX6, were able to increase the accumulation of bulb biomass in onion plants compared to control. This is because bacterial isolates are able to have a positive influence in spurring the development of the weight of wet onion bulbs. Kania & Dawan., (2018) explained that the increase in the size and weight of the tubers reflects the better quality of the tubers, as it shows optimal metabolic and assimilate stockpiling results in the tubers. Meanwhile, the more leaves a plant has, the greater the plant's ability to photosynthesize to produce biomass, so that the fresh weight of leaves increases and the number of bulbs formed increases, which ultimately has an impact on increasing the total weight of wet bulbs produced (Ginting., 2017).

Weight of Dried Tubers of Shallot Plants

Based on the results of various results on the weight of dry bulbs of shallot plants, it shows that the application of bamboo leaf bacterial isolate treatment has an intangible effect on shallot plants at 7 Day After Harvest (DAH). The average weight of dried bulbs of shallot plants from the results of soaking bamboo leaf bacterial isolate can be seen in Table 7.

Table 7. Average weight of dried bulbs of onion plants (grams)

Treatment	Average Weight of dried bulbs (grams)
	7 DAH
X0 (Control)	18.39
BDBX1	12.06
BDBX2	22.89
BDBX3	22.61
BDBX4	20.39
BDBX5	12.11
BDBX6	21.67
BDBX7	18.56

Based on Table 7, the average weight of dried shallot bulbs treated using bamboo leaf bacterial isolate has different effects. The BDBX2 treatment resulted in the highest dry tuber weight of 22.89 g, followed by BDBX3 weighing 22.61 grams and BDBX6 with a dry weight of 21.67 grams, which was all higher compared to the control weighing 18.3 grams. On the other

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hand, the BDBX1 treatment with a dry weight of 12.06 grams and BDBX5 of 12.11 grams showed the lowest results. These results show that some bamboo leaf bacterial isolates are able to improve the process of bulb formation and filling through plant physiological activities, such as the production of growth hormones (indole-3-acetic acid, cytokinin, and gibberelin) which play a role in cell division and enlargement. Meanwhile, some other isolates may be less effective at adapting to the environmental conditions of the onion rhizosphere. The application of organic and biological fertilizers has a positive effect on increasing the weight of dry bulbs of shallot plants (Firmansyah, *et al*, 2017). Macro and micronutrients have an important role in the metabolic process of plants. Macronutrients are required in large quantities, while micronutrients are required in small amounts, but both play a role in the enzyme activity that supports the process of bulb formation and development.

CONCLUSION

1. The treatment of bacterial isolates from bamboo leaves has a real effect on the parameters of the number of seedlings, but it has an unreal effect on the parameters of plant height, number of leaves, number of bulbs, weight of wet bulbs and weight of dry bulbs of onion plants.
2. Bacterial isolate from BDBX2 bamboo leaves exerts a greater influence on the parameters of the number of seedlings of onion plants.

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