Effectiveness of fertilizers with bioremediation techniques for planting jasmine in the home industry bridal flower decoration

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Abstract. Bioremediation is a technique in reducing environmental pollutants. Bioremediation in this study modifies toxic pollutants by utilizing microbial waste and traditional plants that can be used to nourish the home industry jasmine flowers in the manufacture of bridal flower decorations. The study design uses qualitative research. The sampling technique was done purposively. The study was conducted at the bridal studio of Laladon Indah and Beji bridal studio in Depok, which has a special jasmine garden for bridal flower accessories. Samples were obtained through observation. The results showed that; (a) bioremediation techniques with liquid fertilizers are easy to use within the scope of the home industry, (b) bioremediation techniques are considered economical in making and processing materials, and (c) fertilizer manufacturing techniques with bioremediation are declared safe for the environment and can be used for planting and breeding buds jasmine flower which will be used as material for bridal flower accessories.

1. Introduction

1.1. Bioremediation

Bioremediation has been proven to be environmentally friendly, efficient, economical, can be carried out directly in the location to be planted, and the process is quite easy. After being tested, the process of making fertilizer with bioremediation techniques is relatively easy and simple so that it can be utilized by a wide audience. Planting is done through bioremediation fertilization, has no negative impact. Bioremediation fertilization provides benefits to the surrounding environment. In the planting process, no adverse effects are arising from bioremediation fertilizer.

Fertilization techniques with bioremediation in plants have a positive impact because, during the process, bioremediation does not use harmful chemicals, but utilizes microorganisms from organic waste to erode pollutants in the environment around fertilization. Bioremediation works by separating liquid waste and cleaning the affected environment due to chemical wastes. The bioremediation method, considered environmentally friendly, cost-effective, can convert toxic substances into the anti-pollutants safe for the environment by reducing levels of pollutant toxins [1].

The way bioremediation works are to rely on the performance of bacteria to absorb pollutants, and clean up toxic substances so that it can also be said that bioremediation fertilization techniques can accommodate environmentally sustainable development. Bioremediation in plants with microorganisms...
contributes to developing green resource management [2]. The results of previous studies, reported that bioremediation fertilizers provide significant benefits to the environment including, (a) reducing odors, (b) being able to fertilize traditional cosmetics plants, (c) showing plant acceleration when in the seedling process [3].

Organic cosmetics plants that have been studied previously are lemongrass plants, and are declared capable of developing well as long as bioremediation techniques are applied. In this study, bioremediation fertilizer was tested on jasmine plants, which can be used as an alternative plant to minimize metals in the aquatic system, with bioremediation by phytoremediation. The results of previous studies, stated, contamination of freshwater and marine resources that are treated with bioremediation techniques, reducing toxic substances in water, and jasmine flowers planted in the water, monitored well developed and capable of absorbing bioremediation fertilization in water [4].

Other studies also mention that the bioremediation method can overcome environmentally friendly pollution, thereby reducing environmental damage. Bioremediation techniques are stated to be efficient, effective, and able to counter the toxic effects of pollution through microbial and plant mechanisms, with an approach to improve the ability of microbial enzymes to degrade damage that has occurred. Although bioremediation techniques are considered effective, further research on environmental safety still needs to be done as a result of experiments on plant bioremediation [5].

1.2. Jasmine flower as a wedding flower accessories

One of the cosmetics plants in Indonesia, thick with a culture that is often used in traditional wedding events, is jasmine flowers. Jasmine flowers can be planted in a variety of environments, such as in a narrow homeland, large land, until deliberately cultivated for special purposes, one of which is in the need of making bridal accessories. The technique of applying fertilizer to jasmine flowers can be said to be simple because this flower is classified as an easily cultivated flower.

In wedding customs, jasmine is one of the flowers that must be used. Jasmine flower is believed to have a sacred meaning symbol of white, and fragrant and is considered to show the beauty of simplicity, and humility. Jasmine is a traditional flower plant that is considered important so that it is widely cultivated in various countries, especially in the southern hemisphere. Jasmine flowers so far have 2,000 species, and 40 of them jasmine species originating from Indonesia [6]. So far, the application of bioremediation fertilization techniques has not been much studied, especially in the development of bud jasmine flower plants that will be processed into a series of bridal accessories.

Based on the description above, researchers are interested in developing organic fertilizers with bioremediation techniques applied to jasmine plants as bridal flower accessories. The research through making bioremediation fertilizers is simpler and applies the fertilizer to jasmine plants which will be arranged into bridal flower accessories. The novelty of the research from previous research is to see how the effectiveness of fertilization with bioremediation techniques in the home industry, especially in the home industry of jasmine flowers, bridal flower accessories.

2. Methods

This is a research development from the research that has been done. The research design is qualitative, which is done by observation. Samples were taken from the results of jasmine seedlings until the jasmine flower buds were ready to be used as bridal flower accessories. This research assisted with the observation sheet.

Samples included jasmine flowers treated with bioremediation fertilizer and non-bioremediation jasmine flowers than the two were compared. Data analysis and management, including; (a) interpretation of data, (b) transcripts and data checking, (c) literacy studies, (d) coding. The data that has been analyzed is synthesized and summarized in the research report.
3. Results and discussion

3.1. Bioremediation technique
In agricultural practices that use the fertilization process, the manufacture of fertilizers is done organically and inorganically to increase agricultural output. The provision of agricultural nutrition is still found to use fertilizers or pesticides, which harm the environment. The prevalence of pollutants in the environment due to the use of pesticides will increase along with population growth, and human desire is more instantaneous, so bioremediation fertilizer manufacturing techniques can be a solution in agricultural intensification, at an economical cost, using biological functions, limiting chemical materials, reducing waste and can be used as a long-term solution [7].

Bioremediation is a technique to clean up environmental contaminants organically so that polluted environments can be detoxified. Bioremediation is a technology that removes or converts harmful pollutants into harmless with the biological activities of certain microorganisms. The bioremediation process depends on microbial growth and activity, its success is determined by the environmental parameters that influence the growth results and the rate of degraded microbes [8].

In this study, bioremediation was carried out with bio activators, brown sugar, kitchen waste, and water. For the process, all ingredients are put into the drum, then allowed to stand for 4 to 7 days. The drum is left closed to provide moisture and airtight so that bacteria can grow and develop. After the planting process is by the specified time, liquid fertilizer from bioremediation can be used to nourish the jasmine flower plants (See figure 1).

![Figure 1. processing of liquid organic fertilizer.](image)

3.2. Ready to be used as liquid organic fertilizer
In ancient times, humans used local flora and fauna as one of the ingredients in traditional medicine such as reducing fever, reducing cough, eliminating ulcers, curing flatulence, diarrhea, lowering blood glucose, regulating emotions, and reducing menstrual pain, cleaning the kidneys, treating inflammation. Besides, local flora and fauna can also be used as a material for facial and body treatments. The flora is utilized by leaves, roots, flowers, and fruit [9].

In some areas in Indonesia, agriculture still uses chemical-based fertilization, and only a few farmers understand the safety of the environment and soil from chemical fertilizers. If used in the long run, chemical-based fertilizers encourage heavy metal contamination, such as chromium-containing pollutants [10]. This is also the case with the home industry making bridal flower accessories. The fertilizer used as nutrition from the jasmine flower of the bridal decoration is derived from a chemical-
based fertilizer. This is because chemical fertilizers are easier to obtain on the market, and the results of application in plants often do not look much different from plants that use organic fertilizers.

Two research areas of the home industry in making bridal flower accessories before being given education and assistance on making bioremediation fertilizers, using chemical fertilizers on the grounds of lack of knowledge about the adverse effects of the use of chemical fertilizers on the soil or in the environment. After the assistance, the fertilizer that will be used as nutrition in the brides' flower accessories, comes from basic household waste materials that are processed through bioremediation fertilization techniques. The following results are the results of jasmine flower fertilization with bioremediation techniques (see figure 2).

![Figure 2. Jasmine flowers home industry bridal accessories use bioremediation fertilization.](image)

### 3.3. Application of jasmine flowers with bioremediation fertilizer techniques on jasmine flowers bridal flower decoration

The use of jasmine flowers as bridal accessories from the research results, one of which can be seen in Figure 3. The most important traditional brides using jasmine as accessories are Javanese, Sundanese, Palembang, and Banjar customs. Palembang customary marriage requires jasmine flowers to be used by brides as a philosophical accessory of holiness, that the bride and groom always have the same clean heart, away from hostility or family fights, and will not hate each other because they have a relationship as sacred as jasmine. Whereas in Palembang custom, jasmine is more commonly used as a headdress, generally combined with red roses. In Javanese customs, jasmine flower accessories are used starting from the splash ritual, until the wedding procession is used to provide natural fragrance to the bride's body, as well as a mandatory complement in bridal wear.

![Figure 3. Application of jasmine flowers as a result of using bioremediation fertilizer as Javanese bridal accessories.](image)

Brides with other cultural customs in Indonesia, also often use jasmine as bridal accessories, because jasmine is a philosophical flower, and has a long-lasting fragrance so that it is always a choice in the customary wedding procession. Jasmine used is jasmine bud that has not yet fully bloomed, then collected and horizontal *ronce* and nets. Following in detail, the shape and use of jasmine as a bridal decoration:
• Shaped net, serves to wrap the bun
• Like a chain, made dangling as a bride's headdress
• Garnishes on the crown and cowed bow accessories
• Used under the crown
• As gunungan
• Made circular for necklaces
• Flower under the keris applied to the groom's keris
• The flower of the keris or the onion hump, a series resembling the intestine and placed under the keris
• Lar-laran, jasmine flowers are made to look like clothes for a custom procession before the wedding
• Siraman
• Jasmine sling
• Pufferfish pandan
• Jasmine clothes and headbands

4. Conclusion
Nutrition in the form of fertilizer with bioremediation techniques using organic household waste in the home industry making bridal jasmine flower accessories is considered quite simple with economical materials, and the results of the jasmine flower plant accessories bridal accessories, bioremediation fertilizer can fertilize jasmine flowers, and found no problems or failed in planting jasmine buds during fertilization using bioremediation techniques. Thus, bioremediation fertilization can be used on jasmine flowers, which will be developed into bridal accessories.

References
[1] Bibi, Tehmina, Manzoor S, Azhar S, Saeed M and MAR 2019 Role of bioremediation in environment Middle East J Appl Sci Technol (MEJAST) (Peer Rev Int Journal) 2 54–9
[2] Grobelak A, Kokot P, Hutchison D, Grosser A and Kacprzak M 2018 Plant growth-promoting rhizobacteria as an alternative to mineral fertilizers in assisted bioremediation - Sustainable land and waste management J Environ Manage 227 1-9
[3] Nursetiawati S 2019 Study of bioremediation techniques as a process for making organic cosmetics plants fertilizers Journal of Physics: Conference Series 1402(3) 033002
[4] Nakbanpote W, Meesungnoen O and Prasad M N V 2016 Potential of ornamental plants for phytoremediation of heavy metals and income generation Bioremediation and Bioeconomy 179-217
[5] Ojuederie O B and Babalola O O 2017 Microbial and plant-assisted bioremediation of heavy metal polluted environments: A review International Journal of Environmental Research and Public Health 14(12) 1504
[6] Chaitanya H S abd Nataraja S K M 2018 Review on Propagation Techniques of Jasmine (Jasminum sambac (L.)) J Pharmacogn Phytochem 7(6) 593–6
[7] Evans L 2018 Bioremediation Techniques for Agricultural Pollutants 1-5
[8] Zouboulis A I, Moussas P A and Psaltou S G 2019 Groundwater and soil pollution: bioremediation
[9] Kumaresan M, Kannan M, Sankari A, Chandrasekhar CN and Vasanthi D 2019 Phytochemical screening and antioxidant activity of Jasminum multiflorum (pink Kakada) leaves and flowers J Pharmacogn Phytochem 8(3) 1168–73
[10] Utari R D, Masykuri M and Rosariastuti R 2018 Bioremediation using chelator agents (Agrobacterium Sp. I26 and manure) to support environment friendly and healthy agriculture AIP Conference Proceedings 2014(1) 020020