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# ASCOGENLY: ANANAS COMOSUS ENZYME FOR DETERGEN ENVIRONMENTALY FRIENDLY

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***Abstract:*** *Water is one of the most important resources for living organisms; therefore, its quality must be maintained. Indonesia is a maritime country where about 70% of its territory consists of sea and 30% land. The Surabaya City Environmental Service (DLH) reported that around 80% of pollutants entering the Tambak Wedi River originate from household waste. One major cause is surfactant substances from detergents that reduce water surface tension and harm aquatic life. To address this issue, we developed an innovation called Ascogenly, an eco-enzyme made from pineapple peels (Ananas comosus). This project aims to reduce organic waste while minimizing the use of environmentally harmful detergents. Ascogenly is produced by mixing eco-enzyme and baking soda in a 1:10 ratio. Experimental testing showed that fish exposed to commercial detergent X died during observation, whereas fish in the Ascogenly solution survived. These results indicate that Ascogenly is safer for aquatic ecosystems and does not disrupt oxygen circulation. Therefore, Ascogenly has potential as an environmentally friendly detergent alternative.*

**Abstrak:** Air merupakan salah satu sumber daya paling penting bagi makhluk hidup sehingga kualitasnya harus dijaga. Indonesia dikenal sebagai negara maritim dengan sekitar 70% wilayahnya berupa perairan dan 30% daratan. Dinas Lingkungan Hidup (DLH) Kota Surabaya melaporkan bahwa sekitar 80% polutan yang masuk ke Sungai Tambak Wedi berasal dari limbah rumah tangga. Salah satu penyebab utama pencemaran adalah zat surfaktan dari deterjen yang menurunkan tegangan permukaan air dan membahayakan organisme perairan. Untuk mengatasi permasalahan tersebut, dikembangkan inovasi bernama Ascogenly, yaitu eco-enzyme dari kulit nanas (Ananas comosus). Inovasi ini bertujuan mengurangi limbah organik sekaligus menekan penggunaan deterjen yang tidak ramah lingkungan. Ascogenly dibuat dengan mencampurkan eco-enzyme dan baking soda dengan perbandingan 1:10. Hasil pengujian menunjukkan bahwa ikan pada larutan deterjen komersial X mengalami kematian, sedangkan ikan pada larutan Ascogenly tetap hidup selama pengamatan. Temuan ini menunjukkan bahwa Ascogenly lebih aman bagi ekosistem perairan dan berpotensi menjadi alternatif deterjen yang ramah lingkungan serta mendukung pengelolaan limbah berkelanjutan.

## INTRODUCTION

Water is one of the most important needs for living creatures so water quality must be maintained. Indonesia is known as a country maritime where Indonesia's territory consists of 70% sea and the remaining 30% is land. (Indiyani, 2024). Water is one of the needs of living creatures including humans in life daily with high usage every day so that water availability in terms of Quality and quantity are absolutely necessary.

Based on data from the Ministry of Environment and Forestry (KLHK) in the book Indonesian Statistics 2023 released by the Central Statistics Agency (BPS), more than half the quality of river water which is spread across 34 provinces (the newest province of Papua is not included) has experienced status pollution. Water pollution is a condition where water is polluted by components that can cause the quality of the water to decrease so that water becomes non-functional. Water pollution in Indonesia is a serious issue and requires special attention to conservation The environment here is not just the consciousness of one or two people but the consciousness of all people should not continue to drag on regarding this issue.

Water pollution causes damage to water ecosystems such as rivers, lakes and seas where the impact of water pollution is very serious, such as harming biodiversity and threatening the availability of water resources, it also has an impact on human health including various diseases transmitted through polluted water. One of the causes of water pollution is household waste, one of which is detergent. The chemical content in detergent, namely ABS (Alkyl Benzene Sulphonate), can disrupt the respiration process in fish, resulting in death (Ayujuwita, 2024). If this continues to happen it will cause damage to the water ecosystem.

The Surabaya City Environmental Service (DLH) noted that around 80 percent of the parameters or pollutant content entering the Tambak Wedi river come from household waste. This then causes the river mouth to foam because the surfactant content reduces the tension on the water surface. If this condition continues, it can seriously damage the aquatic ecosystem and threaten the survival of organisms living in the river.

Ulfiani Ekasari, Head of Environmental Quality Monitoring and Control, Surabaya City Environmental Service (DLH), said that the foam that appears in the Tambak Wedi river is caused by substances containing surfactants. These substances primarily originate from household waste, particularly detergents and other domestic organic pollutants. To address this issue, the local government has encouraged the construction of communal wastewater treatment plants (IPAL) to reduce domestic pollutants entering the river.

Because there's a large amount of Substance Surfactants that are in the river, we make innovation "benefits of ananas coqmosus" or Which is in theform of eco enzyme from pineapples ,this project could reduce 2 problems here, Which is by reduce organic thrashes and detergent wasted that's not environmentally friendly. By processing pineapple peel waste into eco-enzyme, this innovation helps reduce the accumulation of organic waste in the environment. Furthermore, the eco-enzyme formulation is expected to serve as an alternative cleaning agent that is safer for aquatic ecosystems.

## METHOD

Eco enzyme is a fermented liquid made from 3 ingredients, namely fruit and vegetable peels, molasses (cane molasses) and water. Eco enzyme contains various complex compounds, such as Acetic acid, citric acid and more enzymes, so it is antifungal, bacterial and insecticide. how to make it by mixing the ingredients in a ratio of 1:3:10, 1 for sugar, 3 for fruit and vegetable peels and 10 for water, in our research, we used pineapple peels to make eco enzymes because pineapple peels have many benefits that can be useful For making detergents, the benefits of eco enzymes are: as plant fertilizer, Rat repellent bag, treating injuries or wounds, and others.

How to make Ascogenly is very easy and only requires 2 ingredients, namely, eco enzyme and baking soda, the ratio is 1:10, 1 for baking soda and 10 for eco enzyme, the benefits and advantage of Ascogenly are: environmentally friendly, and could clean stains.

Image 1: Tools And Materials

Image 2: 10 Gram Of Backing Soda


Image 3: 100 Ml Of Eco Enzyme


Image 4: Pour Backing Soda Into Eco Enzyme

Image 5: Stir Until The Backing Soda Is Dissolved And Ascogenly Ready To Use

In this research, ascogenely was tested on water ecosystems containing fish, compared to commercial detergents which often pollute the water. The water used from commercial detergent (detergent Apart from that, Ascogenly will also be compared with detergent X in removing stains on fabric.

Image 6: The Effect Of Used Washing Water On Fish

## RESULTS AND DISCUSSION

### The effect of used washing water on fish

To evaluate the environmental impact of Ascogenly compared to commercial detergent (Detergent X), an experiment was conducted by observing the survival of fish exposed to used washing water for 10 minutes. The number of fish deaths was recorded

at two-minute intervals to determine the level of toxicity of each solution. The detailed results of this observation are presented in Table 1 below.

**Table 1. The Effect of Used Washing Water on Fish**

| No | Time | Fish Condition | |
|---|---|---|---|
| | | Detergent X | Ascogenly |
| 1 | 2 minutes | 0 | 0 |
| 2 | 4 minutes | 0 | 0 |
| 3 | 6 minutes | 1 dead | 0 |
| 4 | 8 minutes | 1 dead | 0 |
| 5 | 10 minutes | 2 dead | 0 |

Source: Research results (2026), processed data

To provide a clearer comparison between the two treatments, the data from Table 1 are also presented in graphical form. The graph illustrates the difference in fish mortality between Detergent X and Ascogenly over time, making it easier to observe the trend and level of environmental impact of each solution.

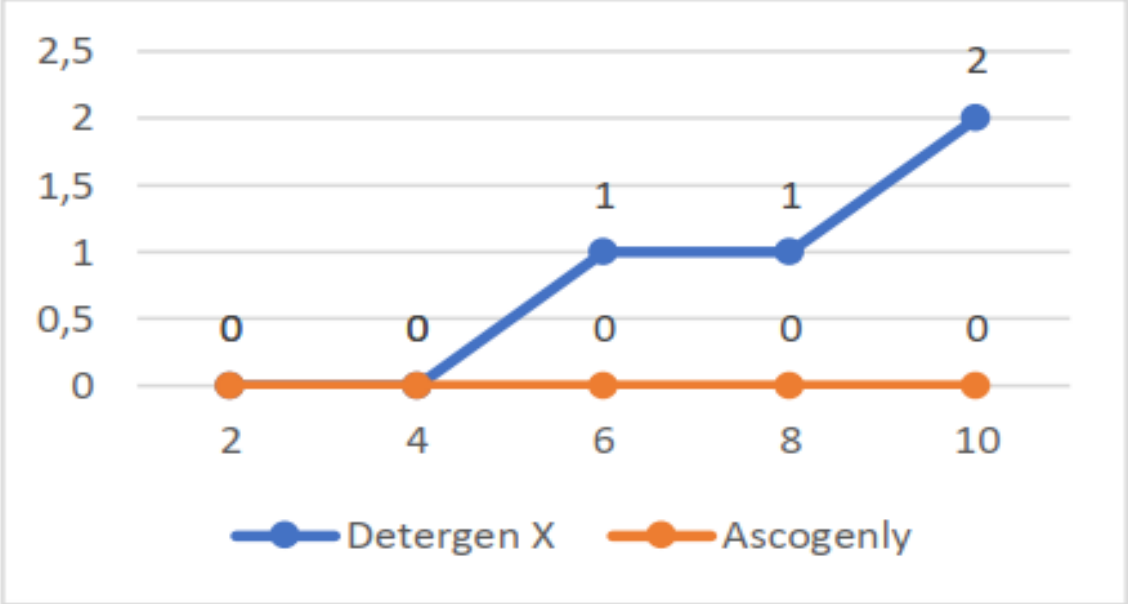


**Figure 7. Fish Mortality Trend in Detergent X and Ascogenly Treatments**

Based on the data, it is known that detergent X, which is a commercial detergent, is not good for the environment, proven by the data that all the fish died. Meanwhile, in ascogenly the fish remain alive without anyone dying, this shows that ascogenly is safe for the aquatic ecosystem, because the content in detergent Eutrophication can inhibit the circulation of oxygen and sunlight, causing aquatic biota to die or become extinct. Then the content in eco enzyme is better than detergent X, because the content in eco enzyme contain. antibacterial compounds such as alcohol, acetic acid and secondary metabolites. These compounds can inhibit bacterial growth.

**Ascogenly to clean stains**

This is our resuts of using detergent X vs using Ascogenly:

**Image 8: Stains In Fabric Before Washing**

**Image 9 : After Washing**

The results of our research are that we can produce a liquid to clean stains such as sauce and oil, after that we tried using some fish to put inside into two different Fluids, Detergent liquid and also eci enzyme liquid, after that, Putting the fish in turns out the result is the fish that we has put in. The fish in the Detergent liquid died in the 10th minute, 57 seconds, whereas our fish in our detergent eco enzyme didn't die.

**Discussion**

Water pollution in Indonesia remains a serious environmental issue, particularly due to domestic waste disposal into rivers. Previous studies have shown that river pollution in both urban and rural areas is strongly influenced by household activities and consumption patterns (Farhan et al., 2023; Indriyani et al., 2024). In Surabaya, approximately 80% of pollutants entering the Tambak Wedi River originate from household waste, especially detergents containing surfactants (Roosa, 2021). Surfactants reduce water surface tension and may disrupt oxygen exchange in aquatic ecosystems, potentially threatening aquatic organisms.

Commercial detergents commonly contain chemical compounds such as Alkyl Benzene Sulfonate (ABS), which can interfere with fish respiration and contribute to aquatic toxicity (Ayujuwita, 2024). This is consistent with the findings of this study, where fish exposed to Detergent X began to die within six minutes and all fish died within ten minutes. In contrast, no fish mortality was observed in water treated with Ascogenly. This indicates that Ascogenly has a significantly lower toxic impact on aquatic organisms compared to commercial detergent.

Eco-enzyme, produced from fermented fruit peels, contains beneficial organic compounds such as acetic acid and natural enzymes that may exhibit antimicrobial properties (Widhiarso et al., 2023; Zultaqawa et al., 2023). In addition, eco-enzyme has been reported as a potential environmentally friendly cleaning alternative (Pradipta, 2023). The use of pineapple peel waste (*Ananas comosus*) in this study not only reduces organic waste but also supports sustainable waste management practices. Therefore, the development of Ascogenly aligns with previous research highlighting the environmental benefits of eco-enzyme utilization.

Overall, the results of this study support the idea that natural-based detergents derived from organic waste can reduce environmental pollution while maintaining cleaning effectiveness. The integration of eco-enzyme and baking soda provides a promising alternative to synthetic detergents, particularly in reducing water pollution caused by household surfactants.

## CONCLUSION

Based on the results of this study, an environmentally friendly detergent can be produced by mixing eco-enzyme derived from pineapple peels (*Ananas comosus*) with baking soda in a 1:10 ratio. The experimental findings showed that Ascogenly did not cause fish mortality during the 10-minute observation period, whereas fish exposed to commercial detergent gradually died, indicating that Ascogenly has a lower toxic effect and is safer for aquatic ecosystems. In addition to being environmentally safer, Ascogenly was proven to effectively remove stains such as sauce and oil, demonstrating that natural-based detergents can maintain cleaning performance while reducing environmental impact. Furthermore, this innovation helps reduce organic waste by converting pineapple peel waste into a useful product, supporting sustainable waste management practices. For future improvement, further studies are recommended to conduct longer observation periods, test more aquatic organisms, and analyze water quality parameters such as pH and dissolved oxygen levels to strengthen the scientific evidence, as well as promote community awareness in using eco-friendly detergents to minimize river pollution.

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