LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah (Artikel)	:	Optimization of organic waste processing using Black Soldier Fly larvae Case study: Diponegoro university		
Jumlah Penulis	:	4 orang (**Ika Bagus Priyambada**, S Sumiyati, A S Puspita, R A Wirawan)		
Status Pengusul	:	penulis ke-1		
Identitas Prosiding	:	a. Judul Prosiding	:	IOP Conference Series: Earth and Environmental Science, Volume 896, The 3rd International Conference on Environment, Sustainability Issues, and Community Development
		b. ISBN/ ISSN	:	17551307
		c. Tahun Terbit / Tempat Pelaksanaan	:	Semarang, Indonesia, 9 September 2021
		d. Penerbit	:	IOP Publishing Ltd
		e. Alamat Repository PT / Web Prosiding	:	https://iopscience.iop.org/article/10.1088/1755-1315/896/1/012017/pdf
		f. Terindex	:	Scopus

Kategori Publikasi Artikel (beri ✓pada kategori yang tepat)	:	√	Prosiding Forum Ilmiah Internasional
			Prosiding Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2.00	3.00	2.50
b. Ruang lingkup dan kedalaman pembahasan (30%)	8.00	8.50	8.25
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	8.00	8.00	8.00
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	8.00	9.00	8.50
Total = (100%)	**26.00**	**28.50**	**27.25**
Nilai Pengusul = 27.25 x 60% = 16.35			

Semarang, 11 April 2023

Reviewer 1

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Reviewer 2

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Kategori Publikasi Artikel (beri ✓pada kategori yang tepat) : [√] Prosiding Forum Ilmiah Internasional; [ ] Prosiding Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional [30]	Nasional [ ]	
a. Kelengkapan unsur isi artikel (10%)	3.00		2
b. Ruang lingkup dan kedalaman pembahasan (30%)	9.00		8
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9.00		8
d. Kelengkapan unsur dan kualitas terbitan/artikel (30%)	9.00		8
Total (100%)	**30.00**		**26**
Nilai Pengusul = 26 x 60% = 15,6			

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1. **Kesesuaian dan kelengkapan unsur isi artikel :**
   Isi artikel lengkap sesuai dengan ketentuan prosiding terbitan IOP. Prosiding ini merupakan hasil dari konferensi internasional, yaitu International Conference on Environment, Sustainability Issues, and Community Development (INCRID) 2021 merupakan konferensi internasional tahunan ketiga yang diselenggarakan oleh Departemen Teknik Lingkungan Universitas Diponegoro. Dengan tema "*Research and Innovation in Environment Towards Sustainability in Disruptive and Post-Global Pandemic Situation*", forum ini mempromosikan semua faktor yang terkait dengan lingkungan teknologi, ilmu pengetahuan, pendidikan dan inovasi untuk mencapai tujuan pembangunan berkelanjutan yang selama ini terkendala oleh situasi pandemi. Oleh karena itu, artikel dan tema konferensi internasional ini sudah sesuai. Unsur isi artikel juga sudah lengkap dan sesuai, yaitu terdiri dari judul, penulis dan afiliasi, abstrak, kata kunci, pendahuluan (beserta tujuan penelitian), metode penelitian, hasil dan pembahasan, kesimpulan, dan daftar pustaka. Daftar pustaka terdiri dari 11 referensi. Seluruh referensi berasal dari jurnal dan prosiding internasional. Referensi yang digunakan mutakhir dengan 100% merupakan terbitan 10 tahun terakhir serta 100% merupakan terbitan 5 tahun terakhir.
   Hasil pengecekan *similarity index* menunjukkan 9% yang berarti karya ilmiah ini bebas dari unsur plagiarisme

2. **Ruang lingkup dan kedalaman pembahasan:**
   Topik merupakan metode alternatif untuk mengolah sampah organik dengan menggunakan *Black Soldier Fly* (BSF) *Larvae*. Penelitian ini berpotensi untuk dapat diaplikasikan dalam rangka pengelolaan sampah di Indonesia. Bahan penelitian yang digunakan disajikan dengan jelas yaitu buah, makanan, sayuran, dan daun. Sampah organik di Indonesia biasanya diolah dengan pengomposan yang ditambah dengan starter yang berupa EM4. Dalam penelitian dilakukan perbandingan pengolahan sampah dengan menggunakan BSF dan EM4. Pembahasan dilakukan berupa perubahan parameter pH, berat larva, temperatur, setiap hari selama 12 hari. Kadar air juga diukur pada awal dan akhir eksperimen. Hasil penelitian dan uji yang digunakan rinci dan dapat menunjukkan kemampuan BSF yang digunakan sebagai pengolah sampah organik. Hal ini menunjukkan manfaat penelitian serta potensinya sebagai tujuan pembangunan berkelanjutan. Pembahasan sudah dilakukan secara mendalam hingga menunjukkan kemampuan reduksi limbah (*Waste Reduction Index* / WRI) pada setiap variasi pengolahan. Hal ini menunjukkan bahwa BSF sangat efisien untuk digunakan untuk mereduksi sampah kupasan buah dalam waktu hanya 12 hari.

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Metode yang dijelaskan sangat rinci dari tahap persiapan bahan hingga pengujian parameter penelitian. Perhitungan yang digunakan untuk analisis data juga diuraikan dengan baik. Tahapan eksperimen yang diuraikan cukup mudah untuk direplikasi oleh audience karena penjelasannya yang detail. Data yang digunakan merupakan data primer sehingga tidak diragukan lagi kemutakhirannya. Data yang disajikan juga cukup untuk mendukung kesimpulan melalui parameter-parameter hasil eksperimen. Penelitian sejenis dalam pengolahan sampah organik dengan BSF dan EM4 dapat digunakan untuk membandingkan hasil penelitian yang diperoleh dari penelitian ini.

4. **Kelengkapan unsur dan kualitas terbitan:**
   Prosiding 'IOP Conf. Series: Earth and Environmental Science 896 yang diterbitkan pada tahun 202 merupakan prosiding yang terindeks Scopus dengan SJR > 0.15, yaitu SJR = 0.202 pada tahun 2021. Prosiding ini juga memiliki CiteScore = 0.6 pada tahun 2021 serta CiteScoreTracker 2022 sebesar 0.8 sehingga menunjukkan bahwa terbitan IOP Conference Series: Earth and Environmental Science dapat mengalami peningkatan dari segi sitasi. Hal ini juga menggambarkan kualitas terbitan yang sangat baik karena artikel-artikel terbitan IOP banyak disitasi oleh artikel lain yang terindeks Scopus. Prosiding ini juga terindeks di Google Scholar dan bersifat open access sehingga dapat memudahkan pembaca untuk mengaksesnya.
   Prosiding ini merupakan hasil artikel terpilih dari The 3rd International Conference on Environment, Sustainability Issues, and Community Development (INCRID 2021) yang dilaksanakan pada tanggal 9 September 2021 berbasis di Semarang, Indonesia (diselenggarakan secara virtual). Prosiding ini merupakan prosiding internasional yang dibuktikan dengan partisipasi lebih dari 5 negara, yaitu sebanyak 12 negara, antara lain Indonesia, India, Uganda, Algeria, Egypt, Madagaskar, Morocco, Gambia, Japan, Taiwan, Australia, Malaysia

Semarang, Maret 2023
Reviewer 1

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		f. Terindex	:	Scopus

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[ ] Prosiding Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional [30]	Nasional [ ]	
a. Kelengkapan unsur isi artikel (10%)	3.00		3.00
b. Ruang lingkup dan kedalaman pembahasan (30%)	9.00		8.50
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9.00		8.00
d. Kelengkapan unsur dan kualitas terbitan/artikel (30%)	9.00		9.00
Total (100%)	**30.00**		28.50
Nilai Pengusul = 28.50 x 60% = 17.10			

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi artikel :**

Isi artikel lengkap sesuai dengan ketentuan prosiding terbitan IOP. Selain itu, prosiding ini juga merupakan hasil dari konferensi internasional, yaitu International Conference on Environment, Sustainability Issues, and Community Development (INCRID) 2021 merupakan konferensi internasional tahunan ketiga yang diselenggarakan oleh Departemen Teknik Lingkungan Universitas Diponegoro. Dengan tema "*Research and Innovation in Environment Towards Sustainability in Disruptive and Post-Global Pandemic Situation*", forum ini mempromosikan semua faktor yang terkait dengan lingkungan teknologi, ilmu pengetahuan, pendidikan dan inovasi untuk mencapai tujuan pembangunan berkelanjutan yang selama ini terkendala oleh situasi pandemi. Oleh karena itu, artikel dan tema konferensi internasional ini sudah sesuai. Unsur isi artikel juga sudah lengkap dan sesuai, yaitu terdiri dari judul, penulis dan afiliasi, abstrak, kata kunci, pendahuluan (beserta tujuan penelitian), metode penelitian, hasil dan pembahasan, kesimpulan, dan daftar pustaka. Daftar pustaka terdiri dari 11 referensi. Seluruh referensi berasal dari jurnal dan prosiding internasional. Referensi yang digunakan mutakhir dengan 100% merupakan terbitan 10 tahun terakhir serta 100% merupakan terbitan 5 tahun terakhir. Hasil pengecekan *similarity index* menunjukkan 6% yang berarti karya ilmiah ini bebas dari unsur plagiarisme.

2. **Ruang lingkup dan kedalaman pembahasan:**

Topik yang diambil sangat menarik yaitu alternatif metode untuk mengolah sampah organik dengan menggunakan *Black Soldier Fly* (BSF) *Larvae*. Sampah organik merupakan komponen terbesar sampah rumah tangga baik di perkotaan maupun di pedesaan. Oleh karena itu, penelitian ini berpotensi tinggi untuk dapat diaplikasikan pada permasalahan sampah di Indonesia. Sampah organik yang digunakan diuraikan dengan jelas yaitu berupa kupasan buah, makanan, sayuran, dan daun. Sampah organik di Indonesia biasanya diolah dengan pengomposan yang ditambah dengan EM4. Dalam penelitian ini telah dibandingkan performa BSF dan EM4 dalam mengolah limbah organik. Pembahasan dilakukan dengan mendalam yaitu perubahan parameter pH, berat larva, temperatur, setiap hari hingga 12 hari. Kandungan air juga diukur pada awal dan akhir eksperimen. Hasil penelitian dan uji yang digunakan rinci dan dapat menunjukkan kemampuan BSF yang digunakan sebagai pengolah sampah organik. Hal ini menunjukkan kebermanfaatan penelitian serta potensinya sebagai tujuan pembangunan berkelanjutan. Pembahasan sudah dilakukan secara mendalam hingga menunjukkan kemampuan reduksi limbah (*Waste Reduction Index* / WRI) pada setiap variasi pengolahan. Hal ini menunjukkan bahwa BSF sangat efisien untuk digunakan untuk mereduksi sampah kupasan buah dalam waktu hanya 12 hari.

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**

Metode yang dijelaskan sangat rinci dari tahap persiapan bahan hingga pengujian parameter penelitian. Perhitungan yang digunakan untuk analisis data juga diuraikan dengan baik. Tahapan eksperimen yang diuraikan cukup mudah untuk direplikasi oleh audience karena penjelasannya yang detail. Data yang digunakan merupakan data primer sehingga tidak diragukan lagi kemutakhirannya. Data yang disajikan juga cukup untuk mendukung kesimpulan melalui parameter-parameter hasil eksperimen. Penelitian sejenis dalam pengolahan sampah organik dengan BSF dan EM4 dapat digunakan untuk membandingkan hasil penelitian yang diperoleh dari penelitian ini.

4. **Kelengkapan unsur dan kualitas terbitan:**

Prosiding 'IOP Conf. Series: Earth and Environmental Science 896 yang diterbitkan pada tahun 202 merupakan prosiding yang terindeks Scopus dengan SJR > 0.15, yaitu SJR = 0.202 pada tahun 2021. Prosiding ini juga memiliki CiteScore = 0.6 pada tahun 2021 serta CiteScoreTracker 2022 sebesar 0.8 sehingga menunjukkan bahwa terbitan IOP Conference Series: Earth and Environmental Science dapat mengalami peningkatan dari segi sitasi. Hal ini juga menggambarkan kualitas terbitan yang sangat baik karena artikel-artikel terbitan IOP banyak disitasi oleh artikel lain yang terindeks Scopus. Prosiding ini juga terindeks di Google Scholar dan bersifat open access sehingga dapat memudahkan pembaca untuk mengaksesnya.

Prosiding ini merupakan hasil artikel terpilih dari The 3rd International Conference on Environment, Sustainability Issues, and Community Development (INCRID 2021) yang dilaksanakan pada tanggal 9 September 2021 berbasis di Semarang, Indonesia (diselenggarakan secara virtual). Prosiding ini merupakan prosiding internasional yang dibuktikan dengan partisipasi lebih dari 5 negara, yaitu sebanyak 12 negara, antara lain Indonesia, India, Uganda, Algeria, Egypt, Madagaskar, Morocco, Gambia, Japan, Taiwan, Australia, Malaysia.

Semarang, 24 Maret 2023
Reviewer 2

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Source details

IOP Conference Series: Earth and Environmental Science

Scopus coverage years: from 2010 to Present

ISSN: 1755-1307 E-ISSN: 1755-1315

Subject area: Earth and Planetary Sciences: General Earth and Planetary Sciences

Environmental Science: General Environmental Science

Source type: Conference Proceeding

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Last updated on 05 March, 2023 • Updated monthly

CiteScore rank 2021

Category	Rank	Percentile
Earth and Planetary Sciences General Earth and Planetary Sciences	#153/191	20th
Environmental Science General Environmental	#191/228	16th

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2021

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Accepted papers received: 13 October 2021
Published online: 12 November 2021

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Holistic perspective to knowledge integration for performance of renewable and sustainable energy business

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Abstract. Power generation and consumption globally has always been on the top agenda for any country since it contributes to the basic needs of human beings. In the race of bridging the supply and demand gap, human beings created side effects in the name of environmental pollution. The alternate source of energy is renewable energy, and many nations are committed to adopting these new forms of energy generation; these still contribute lesser than one-fourth of global energy consumption and power generation. This study aims to focus on knowledge integration for the performance of the renewable business segment. It creates a more practical alternative against other forms of energy generations like Thermal, natural gas-based. There are areas like a waste of energy as an example where it is still a lesser-known world. Many measurement techniques are still explored, which suggests Knowledge plays a vital role in the Business Performance of Renewable and Sustainable energy and in implementing Global Climate Control Strategies. The study results indicate the energy sector's transformation into the renewable energy sector, highlighting innovations, knowledge integration, effect on performance, and role of management & government.

1. Introduction

Energy has many usages like power generation for electricity purposes, heat exchange requirements in process industries, and other services. The most generated energy was coal (thermal), water (hydro), natural gas, nuclear, oil. As every nation needed energy for primary usage like electricity, they have invested a lot of money and decades on these forms of energy. As the gap between supply and demand, the investment expanded from the government to private in most countries. However, this also has invited climate issues like environmental pollution, which is the biggest survival challenge of the earth and a threat to the future generation.

Here comes the importance of the new form of energies or earlier lesser prioritized form of energy sources like solar, wind, biofuel, geothermal, hydro, wave, tidal. The volume of energy (MW or GW) generated by earlier forms like thermal was not easy or even sometimes impossible in the new form of energy like solar and wind. Depend on the geography and other resources each nation has. However, the technologies and investments in research have explored out-of-the-box thinking ideas, and many nations already started investing in renewable and sustainable energy. It has created opportunities for more considerable change on a global level, but due to a gap of resources, including knowledge, the target time to achieve the transformation committed by most nations is challenging. Hence knowledge

Risk analysis-based reliability assessment approach under epistemic uncertainty using a dynamic evidential network

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Abstract. Probabilistic modeling is widely used in industrial practices, particularly for assessing complex systems' safety, risk analysis, and reliability. Conventional risk analysis methodologies generally have a limited ability to deal with dependence, failure behavior, and epistemic uncertainty such as parameter uncertainty. This work proposes a risk-based reliability assessment approach using a dynamic evidential network (DEN). The proposed model integrates Dempster-Shafer theory (DST) for describing parameter uncertainty with a dynamic Bayesian network (DBN) for dependency representation and multi-state system reliability. This approach treats uncertainty propagation across conditional belief mass tables (CBMT). According to the results acquired in an interval, it is possible to analyze the risk like interval theory, and ignoring this uncertainty may lead to prejudiced results. The epistemic uncertainty should be adequately defined before performing the risk analysis. A case study of a level control system is used to highlight the methodology's ability to capture dynamic changes in the process, uncertainty modeling, and sensitivity analysis that can serve decision making.

1. Introduction

In the last century, many industries have been complex and involved in the latest technological innovation. This technological development is accompanied by a continuous improvement of safety, which stays one of the main concerns in this field. Nowadays, the need for safety measures should be emphasized due to the possibility of catastrophic accidents resulting from this high innovation and development [1–2]. The safety engineer used many quantitative or qualitative methods for risk analysis such as failure mode and effects analysis (FMEA), what-if analysis, hazard and operability analysis (HAZOP), fault tree analysis (FTA), and Bayesian networks (B.N.) … etc. Each method has its advantages and disadvantages. Most of these techniques are developed for treating aleatory and epistemic uncertainty using possibility theory, evidence theory, and fuzzy sets theory [3–4].

The B.N. has become more prevalent in reliability, availability, safety, and risk assessment for complex systems [5–7]. A review is presented in [8] that studied a recent brief statistical of B.N. applicability in the chemical and process industry. B.N. is applied as a dynamic safety analysis for a complex process. For example, Zarei et al. [9] applied a dynamic risk analysis approach for natural gas

Proposing a new strategy to minimize domestic wastewater under the influence of human factor in Antananarivo, Madagascar

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Abstract. Water pollution happens when organic or inorganic materials, even solid materials are poured into the water which degrades its physicochemical quality. The purpose of this study is, to identify, to describe and to highlight the major source of wastewater, and proposing a new strategy for minimization in Antananarivo, Madagascar. Antananarivo is one of the dirtiest cities on the African continent according to the classification made by Forbes magazine and Afrikmag. To know the current situation, an in-situ analysis of the physical parameters: colour, odour, turbidity and electrical conductivity using the turbidimeter and the conductometer are measurable parameters in the field. Major elements analyses, BOD_5 using Oxytop method analysis, COD using Potassium dichromate, suspended solids using membrane filtration are measured in the laboratory. The turbidity of the discharges fluctuates from 127 NTU to 421 NTU). For electrical conductivity, it varies from 217 to 977µS.cm^{-1}, BOD_5 is of the order 3 to 88mg.L^{-1}, while COD diverges from 279mg.L^{-1} to 730mg.L^{-1} and suspended matter oscillates from 400mg.L^{-1} to 60mg.L^{-1}. Some parameters and concentrations exceeded the discharge standard Malagasy and the international Standard. The best solution for the management of water quality in the face of domestic pollution is the treatment of wastewater before discharge into receiving environments and the sensibilization of the population to take their responsibility.

Optimization of organic waste processing using Black Soldier Fly larvae Case study: Diponegoro university

by Ika Bagus Priyambada

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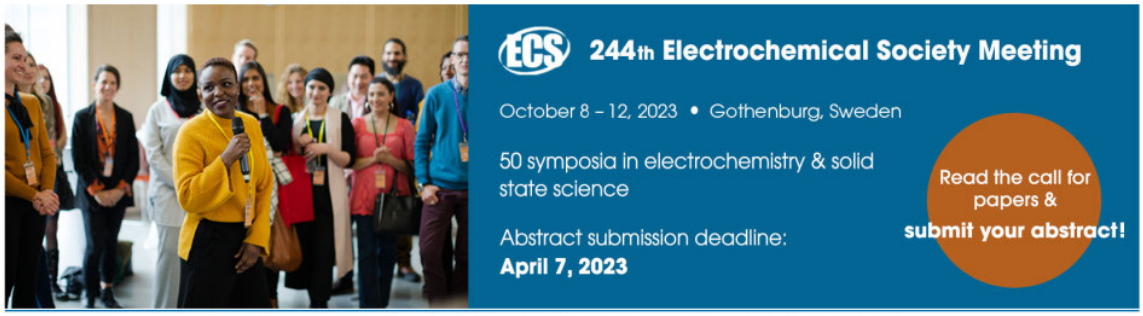

Optimization of organic waste processing using Black Soldier Fly larvae
Case study: Diponegoro university

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Abstract. Waste that is not handled correctly can cause problems for humans and the environment. Therefore, proper waste management efforts are needed to solve this waste problem. One method of processing organic waste is the use of Black Soldier Fly (BSF) larvae. Larvae BSF can degrade organic waste, and the life cycle of BSF acts as a decomposer. This study examines BSF larvae's ability to decompose biodegradable organic waste, especially for banana waste, cucumber waste, and food waste in the Diponegoro University environment, and to decide the effect of the variable type of food. The frequency of feeding carried out on the growth rate of BSF larvae and to choose the decomposition results of biodegradable organic waste carried out by BSF larvae. This research method is carried out by comparing the effectiveness of waste degradation by BFS with EM4. The value of significance in degrading waste is obtained from the calculation of the Waste Reduction Index, or it can be called WRI. The analysis results show that the WRI value in waste processing using BFS is more significant than in waste processing using EM4. That concludes that BSF fly larvae (*Hermetia illucens*) effectively reduce organic waste compared to EM4.

1. Introduction

Due to the increasing construction of construction facilities and the growth of campus residents at Diponegoro University, the greater the responsibility and challenges to deal with various waste problems. The waste problem is one of the problems, both in developed and developing countries, especially organic waste, which has not been resolved. The processed organic waste includes food residues and unwanted by-products from various industries, such as sewage sludge from sewage treatment plants, animal manure from livestock, and tofu residue from the manufacturing process of tofu. In large cities, the average solid waste generated is 2.01 billion tons/year. According to researchers, by 2050, landfills will reach 3.4 billion tons/year [1]. A large amount of organic waste will emit 1.6 billion metric tons of carbon dioxide, which will cause damage to the environment, which will increase to 2.6 billion metric tons by 2050 [1]. Improper organic waste management can also lead to many environmental threats and economic difficulties, such as increased flood risk and adverse effects on groundwater [2]. One of waste management is recycling. A more ecological and circular economy requires the recycling of organic waste [3]. Therefore, it is necessary to reduce waste appropriately to manage large amounts of organic waste safely and sustainably. In this case, insect larvae that reduce organic waste have proven to be effective and environmentally friendly because the larvae can ingest

organic waste and convert it into larval biomass through the assimilation process without harming humans and the surrounding environment. The black army fly or *Hermetia illucens* is considered an ideal insect species because its larvae (BSFL) can biotransform various decay, survive under various environmental conditions, inhibit the growth of harmful microorganisms, and most importantly, adult Flies are not pests [4]. Another study found that BSF larvae can reduce the total waste by 50-80% (wet) [5].

The waste generated at Diponegoro University can be very diverse, one of which is organic waste produced from leftovers from food or snacks for students or leftovers from the canteen. In addition, there is also leaf litter scattered because of the many trees at Diponegoro University. However, most public considers organic waste processing as food waste with no economic value [3]. That is because the manager only sees in terms of the benefits derived from organic waste management. One concrete example is composting, which is not competitive with chemical fertilizers, which results in a low selling price of organic compost. In the end, the organic waste will be transported and stockpiled in the landfill [3].

This research will be carried out by using BSF larvae to degrade organic waste as food ingredients. Organic waste used as a sample was waste from student food scraps, leftovers from cooking or food in the canteen, and leaf waste. The final result of the research is to determine the percentage of organic waste reduction at Diponegoro University, which can be done through the use of BSF larvae.

2. Methodology

2.1. Material preparation

Preparation of the study was made by preparing tools and materials that will be used for experiments. The tools used are:

- Twelve containers, this is a plastic container used for composting.
- The analytical balance is used to measure the mass of organic waste and BSF. This working starts when the object is placed on the disk, where the object's mass will be distributed evenly throughout the area of the weighing disk.
- PH meter used to measure the PH in containers. PH meters measure the voltage between two electrodes and display the result converted into the corresponding pH value.
- A moisture analyser was used to measure the water content. The moisture analyser works with the LOD (Lost of Drying) measurement principle. The LOD will calculate the water and any other solvents lost in the heating process.

The materials used in this study are:

- Organic waste consists of fruit waste, vegetable waste, food waste, and new leaf waste. Each mass is 500 grams.
- maggot/BSF larvae as composting media, EM4 as a fermenter
- EM4 as a fermenter.

2.2. Experimental procedures

The research was conducted as follows:

- Divide organic waste into three parts for each type of waste to be put into containers so that it becomes 12
- Each container has a mass of 500 grams. Each type of waste is assigned a number 1, 2, and 3.
- Add magot to containers 1 and 2, and add EM4 to containers.
- On the first day, measuring the mass, water content, and pH of the waste in each container.
- Day 2 to day 12, measuring the mass of magot and pH in containers 1 and 2 and PH in container 3.

- On the 12th day, we measure the mass of waste, water content, and PH in each container and the mass of magot in each container.
- Make a record of the data obtained for analysis.

2.3. Data analysis

The data analysis is the waste weight that is important because it can determine the larvae waste reduction index. The total feed reduction is calculated first to calculate the waste reduction index, with the equation proposed by [6] as follows:

$$D = \frac{W - R}{W} \tag{2.1}$$

D = total feed reduction (mg)
W = total amount of feed provided (mg)
R = remaining substrate (mg)

Furthermore, to calculate the waste reduction index used the formula:

$$WRI = \frac{D}{t} \times 100 \tag{2.2}$$

D = total feed reduction (mg)
WRI = Waste Reduction Index
t = days of trial (day)

3. Results and discussion

3.1. pH

Based on the results, it was found that the pH of the waste during the study follows:

Tabel 1. pH of organic waste.

Day	Fruit Peel Waste			Food Waste			Vegetable Waste			Leaf Waste		
	BSF 1	BSF 2	EM4	BSF 1	BSF 2	EM4	BSF 1	BSF 2	EM4	BSF 1	BSF 2	EM4
1.	4.03	4.01	4.04	4.49	4.46	4.03	4.89	5.79	6.64	8.72	8.5	7.88
2.	4.038	4.07	4.69	4.64	4.5	4.43	8.69	8.39	7.95	8.15	8.32	8.15
3.	4,2	4.08	4.61	4.45	4.5	5.02	8.0	7.99	8.11	8.22	8.35	8.03
4.	4.13	4.06	4.65	4.55	4.4	4.94	8.3	8.12	8.1	8.23	8.21	8.08
5.	4.038	4.07	4.69	4.64	4.5	4.43	8.69	8.39	7.95	8.15	8.32	8.15
6.	4.53	4.88	5.29	4.54	4.64	4.65	7.92	8	8.59	8.72	8	8.58
7.	6.65	6.83	6.34	5.93	4.69	6.10	8.80	8.77	8.93	9.04	8.82	9.1
8.	7.43	7.17	6.94	5.06	5.7	5.98	9.02	8.92	9.02	8.94	8.82	9.04
9.	7.42	7.55	6.46	5.27	6.68	5.82	9.18	8.98	8.89	9.06	9.10	9.10
10.	7.10	7.40	6.36	5.55	6.83	5.04	9.23	9.13	8.96	9.03	9.26	9.26
11.	6.86	7.20	6.53	6.10	6.94	4.57	9.24	9.30	9.15	9.13	9.14	9.14
12.	6.76	7.30	6.59	6.21	7.05	4.67	9.32	9.23	9.1	9.21	9.2	9.2

The result shows that the pH of all kinds of waste has a volatile trend where it was in the pH range of 4.01 – 7.55 for the fruit peel waste; 4.4 – 7.05 for the food waste; 4.89 – 9.32 for the vegetable waste; 8 – 9.26 for the leaf waste. In general, the BSF's pH from all kinds of waste has a similar pH range trend with the EM4. This result is also confirming previous studies that showed BSF larvae are competent in opposing and manipulating acidic (pH = 4.0) and primary (pH = 9.5) environments [7].

3.2. Water content

It was found that the water content of the waste during the study was as follows:

Tabel 2. The initial water content of the waste.

	Kind of waste			
Larvae	**Fruit Peel**	**Food**	**Vegetable**	**Leaf**
BSF 1 (initially)	88.24%	77.07%	94.03%	45.44%
BSF 1 (final)	81.97%	87.29%	96.2%	22.39%
BSF 2 (initially)	86.12%	80.17%	93.71%	41.45%
BSF 2 (final)	92.55%	89.14%	99.98%	74.61%

The optimum water content in BSF larval food is between 60-90% [8]. The result shows that the fruit peel waste and the food waste are still in the positive range of water content, yet the vegetable waste exceeds, and the leaf waste is below the optimum range. The survival rate of larvae decreases with the increase of water content. When the survival rate is high, the weight of the larvae decreases with the increase of water content. When the survival rate decreases, the survival rate increases [9].

The increase in water content indicates a process of waste decomposition. Increasing the water content in the waste can make it difficult for BSF larvae to reduce waste and cause the death of BSF larvae. If the water content is too high, it will also make it difficult to separate the residue from the insect biomass, so it is considered necessary to adjust the water content of the waste before using BSF to treat the waste [10]. The high microbial activity in the matrix with low matrix moisture content may be related to the high porosity and favourable oxygen transfer rate [11]. The high-water content and poor substrate structure may also cause problems for the late larvae as the larvae grow and develop through instar, their weight.

3.3. Larva weight

Sections It was found that the BSF larvae weight during the study was as follow:

Tabel 3. Larvae weight.

Day-	Kind of waste							
	Fruit Peel		**Food**		**Vegetable**		**Leaf**	
	BSF 1	**BSF 2**	**BSF 1**	**BSF 2**	**BSF 1**	**BSF 2**	**BSF 1**	**BSF 2**
1	0.1338	0.2480	0.1183	0.1390	0.1203	0.1569	0.1236	0.0643
2	0.1440	0.0986	0.1429	0.2179	0.0693	0.1080	0.0927	0.1407
3	0.1734	0.0943	0.1234	0.1839	0.0936	0.1134	0.1432	0.1312
4	0.0967	0.1003	0.1421	0.1242	0.1014	0.1321	0.1474	0.1131
5	0.0982	0.1014	0.1598	0.1609	0.1316	0.2138	0.1773	0.1162
6	0.1393	0.9892	0.1482	0.1098	0.1294	0.1455	0.1648	0.1532
7	0.1825	0.1632	0.1558	0.1928	0.1585	0.1585	0.1528	0.1623
8	0.1803	0.1825	0.2134	0.2279	0.2044	0.3130	0.1316	0.0372
9	0.1892	0.1343	0.3390	0.2190	0.2135	0.1485	0.1310	0.1019
10	0.1827	0.1750	0.2473	0.1971	0.1685	0.1651	0.1320	0.9900
11	0.1573	0.3829	0.3187	0.2807	0.2370	0.1400	0.1277	0.1651
12	0.1487	0.1912	0.1302	0.1407	0.1528	0.1070	0.1302	0.1332

The result shows that the weight of the BSF larvae, both BSF 1 and BSF 2, has a volatile weight development with a trend of increasing from the initial weight to the final weight except for the BSF 2 of the fruit peel waste and the BSF 2 of the vegetable waste.

3.4. Room humidity

During the research, the humidity of the room where the study was conducted was as follows:

Tabel 4. Room humidity.

Day-	Humidity
1	55.5
2	53.2
3	72.3
4	80.0
5	90.4
6	93.3
7	70.1
8	72.0
9	66.2
10	72.1
11	82.1

From these results, it can be seen that the initial humidity of the room is 55.5% which then decreases on the 2nd day. From the 3rd to the 6th day, the humidity rose to 93.3%. Then from day 7 to day 12, the humidity fluctuated until the absolute humidity of the room was 80.7%. Room humidity affects the survival rate of larvae, where the optimal humidity for larval growth is 70%.

3.5. Room temperature

During the study, the room temperature where the research took place was measured with the following results.

Tabel 5. Room temperature.

Day-	Temperature (°C)
1	28.5
2	29.7
3	28.1
4	27.4
5	26.3
6	24.4
7	29.4
8	27.7
9	28.6
10	27.6
11	27.5
12	27.8

From the results obtained, it is known that the room temperature on day 1 is 28.5°C. The room temperature fluctuated, with the lowest temperature being 24.4°C and the highest temperature reaching 29.4°C. The room temperature on the last day was 27.8°C. The average room temperature for 12 days was 27.7°C. This temperature is still in the optimum temperature range for the growth of BSF larvae. The BSFL is the warm temperature species. The best suitable temperature condition is between 25°C to 35°C. The temperature should not exceed 40°C because chances of surviving are reduced and inactivity induced when the temperature goes below 10°C[8].

3.6. Waste reduction index

Waste Reduction Index (WRI) at the final of the experiment is as follows:

Tabel 6. Waste reduction.

	WRI (%/day)			
Container	**Fruit Peel**	**Food**	**Vegetable**	**Leaf**
BSF 1	4.36	2.5	1.75	2.03
BSF 2	4.2	2.3	1.53	1.88
EM4	3.1	1.5	2.03	1.16

The higher the WRI value, the more waste consumed. The result shows that the waste processing with BSF larvae is more effective in reducing waste for fruit peel waste, food waste, and leaf waste as the WRI value is higher in BSF larvae than the WRI value of EM4. For the vegetable waste, the WRI value of the EM4 container has a higher WRI value than in the BSF container. The most effective waste reduction is in the BSF 1 container for the fruit peel waste as it has 4.36% waste reduction per day.

4. Conclusion

Footnotes Organic waste management at Diponegoro University can be further optimized by processing organic waste using BSF larvae to reduce the amount of waste of Diponegoro University.

The ability to reduce organic waste by BSF larvae is more effective than EM4 that showed with Waste Reduction Index. For fruit peel waste, the WRI for BSF is 4.36 and 4.2%/day; meanwhile, EM4 is 3.2%/day. WRI for food waste is 2.5 and 2.3%/day for BSF and 1.5%/day for EM4. The WRI of BSF for vegetable waste is 1.75 and 1.53%/day, and WRI for EM4 is 2.03%/day. Furthermore, lastly, WRI for leaf waste are 2.03 and 1.88%/day for BSF and 1.16%/day for EM4. Therefore, it can be concluded that BSF can reduce organic waste better than EM4.

References

[1] Ellis C 2018 *World Bank: Global waste generation could increase 70% by 2050 Waste Dive*
[2] Dhita A A, Rahmadi A and Hikmaya 2018 *Potensi Banjir Akibat Sampah di Aliran Sungai Cinambo* (Bandung: UIN SGD)
[3] Wei Y, Wang, Ning, Lin, Yongfeng, Zhan, Yabin, Ding, Xiaoyan, Liu, Yongdi, Zhang, Ake, Ding, Guo-chun, Xu, Ting, Li and Ji 2021 *Bioresour Technol* **337** 125411
[4] Tomberlin J and Cammack J 2017 *Black soldier fly: biology and mass production. Insects as food and feed: from production to consumption* (Wageningen, the Netherlands: Wageningen Academic Publishers) p 231-246
[5] Ferronato N and Torretta V 2019 *Int J Environ Res Public Health* **16(6)** 1060
[6] Mertenat, A., S. Diener, and C. Zurbrügg 2018 Waste manag **84** 173-181
[7] Meneguz M, Schiavone A, Gai F, Dama A, Lussiana C, Renna M, Gasco L 2018 J Sci Food Agric **98(15)** 5776-5784
[8] Khilare P R and Kulkarni S S 2020 *Int j res appl sci eng technol* **October 2020**
[9] Lalander C, Ermolaev E, Wiklicky V, Vinnerås B2020 *Sci Total Environ* **729** 138968
[10] Cheng J Y, Chiu S L and Lo I M 2017 *Waste manag* **67** 315-323
[11] Palma L, Ceballos S, Johnson P, Niemeier D, Pitesky M, VanderGheynst J 2018 *J Sci Food Agric* **98(15)** 5893-5900

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