

Limbah organik merupakan permasalahan umum yang terjadi di sebagian besar negara berkembang, termasuk Indonesia seperti limbah makanan, limbah perkebunan, dan limbah pasar. Proses biokonversi limbah organik dengan *Black Soldier Fly (BSF)* dianggap sebagai langkah efektif dalam mendegradasi limbah organik. Proses ini menghasilkan magot sebagai pakan ternak dan residu padat sebagai kompos. Penelitian ini bertujuan untuk mengetahui pengaruh jenis pakan dan variasi waktu biokonversi terhadap berat larva, *substrate consumption (SC)*, *waste reduction index (WRI)*, *yield*, hasil NPK residu pakan dan hasil proksimat larva *BSF*. Selain itu, dilakukan juga pengamatan terhadap pH, suhu, dan kelembapan selama proses biokonversi untuk setiap jenis pakan. Pakan larva yang digunakan yaitu limbah nasi, limbah buah pisang, dan kotoran ayam dengan variasi waktu biokonversi selama 3, 6, dan 9 hari.

Tahapan penelitian ini diawali dengan proses persiapan bahan baku dan rangkaian alat penelitian. Persiapan bahan baku meliputi penetasan telur larva *BSF* dan dirawat hingga usia 12 hari dengan pemberian pakan sesuai variasi yang digunakan. Tahap selanjutnya adalah pengomposan melalui metode biokonversi dengan perbandingan larva *BSF* dan pakan larva sebesar 0.17 kg : 1 kg. Selama proses biokonversi dilakukan pengamatan pH, suhu, dan kelembapan residu. Selanjutnya dilakukan proses pemisahan larva dan residu pakan sesuai variasi waktu. Residu yang dihasilkan kemudian dianalisis kadar N, P, dan K, sedangkan pada larva *BSF* dilakukan analisis proksimat.

Hasil penelitian menunjukkan bahwa berat larva mengalami kenaikan dan penurunan. Larva paling optimum mereduksi limbah pisang hingga hari ke-9 dengan nilai SC sebesar 87,00%. Nilai *WRI* tertinggi terdapat pada hari ke-tiga dengan pakan limbah nasi dengan nilai 23,17%/hari. *Yield* larva tertinggi terdapat pada pakan kotoran ayam hari ke-tiga yaitu sebesar 89,01%. Kadar N-total residu pada berbagai pakan berkisar antara 2,5-4%, kadar phosphor berkisar antara 1-7%, dan kadar kalium pada residu berkisar antara 9-90%. Kadar protein tertinggi terdapat pada pakan kotoran ayam hari ke-enam dengan nilai 31,85% dan kadar lemak dan karbohidrat maggot berkisar antara 20-40%. Kadar abu maggot berkisar 3% sedangkan pada maggot dengan pakan limbah kotoran ayam mencapai 26,63%. Larva dapat dijadikan sebagai pakan ternak karena kadar proteinnya yang tinggi. Kadar NPK pada residu tersebut telah sesuai SNI 19-7030-2004 sehingga pupuk yang dihasilkan dikategorikan baik untuk pertumbuhan tanaman.

Kata kunci: limbah organik, *BSF* larvae, bioconversion, NPK kompos, nutrisi larva

Organic waste is a common problem that occurs in most developing countries, including Indonesia such as food, market, and garden waste. The bioconversion process of organic waste using Black Soldier Fly (*BSF*) has been considered an effective way in degrading organic waste. This process produces larvae as feed and solid residue as compost. The research aimed to discover the effects of feedstock and processing time variation on the nutrient of *BSF* larvae and nutrient of residue as compost. This study aims to determine the effect of feed type and bioconversion time variation on larval weight, *substrate consumption* (*SC*), waste reduction index (*WRI*), *yield*, feed residue NPK *yield* and proximate *yield* of *BSF* larvae. In addition, observations were also made on pH, temperature, and humidity during the bioconversion process for each type of feed. The larval feed used was rice waste, banana waste, and chicken manure with variations in bioconversion time for 3, 6, and 9 days.

This research phase begins with the process of preparing raw materials and a series of research tools. Preparation of raw materials includes hatching *BSF* larvae eggs that are treated up to 12 days of age with feeding according to the variation used. The next stage is composting through the bioconversion method with a ratio of *BSF* larvae and larval feed of 0.17 kg: 1 kg. During the bioconversion process, pH, temperature, and residual humidity were observed. subsequently, the separation process is carried out to separate the larvae and residues according to time variations. afterwards, the residues produced were analyzed for levels of N, P, and K, while the *BSF* larvae were analyzed proximately.

The results showed that the larval weight was decreased and increased. Larvae have optimally reduced waste on the 9<sup>th</sup> day using banana waste. The percentage of *substrate consumption* was 87.00%. The greatest value of the Waste Reduction Index (*WRI*) was found in rice waste feed on the 3<sup>rd</sup> day of 23.17%/day. The largest larvae *yield* was found in larvae with chicken manure feed on the 3<sup>rd</sup> day with *yield* of 89.01%. Total nitrogen content of residue for all treatments was around 2.5-4% with the highest value was found in larvae with rice waste feed on 6<sup>th</sup> day of 3.98%. The phosphor content of residue was around 1-7%, meanwhile potassium content of residue was around 9-90%. The largest protein content was found in larvae with chicken manure feed on the 6<sup>th</sup> 31.85%, meanwhile fat and carbohydrate content of larvae was around 20-40%. Ash content of larvae was around 3% in rice waste and banana waste, meanwhile in larvae with chicken manure feed rise to 26.63%. Larvae were well utilized as feed for fish or poultry because of their high protein content. According to SNI 19-7030-2004, the nitrogen, phosphor, and potassium content of the residue was categorized as good growth.t for plant

Keyword: organic waste, *BSF* larvae, bio-conversion, NPK of compost, larval nutrients