

## RINGKASAN

Industri tapioka merupakan sektor agroindustri yang tidak terlepas dari permasalahan limbah. Limbah yang dihasilkan menyebabkan pencemaran terutama diakibatkan oleh limbah cair. Limbah cair industri tapioka terutama skala rumah tangga biasanya langsung dibuang ke lingkungan sehingga menyebabkan pencemaran seperti bau busuk, penurunan kualitas air sungai, kematian biota air dan perubahan warna air sungai. Limbah cair tapioka banyak mengandung komponen organik yang cukup tinggi sehingga dapat diolah menjadi pupuk organik cair (POC). POC limbah tapioka mempunyai nilai jual tinggi dan ramah lingkungan karena tidak menggunakan senyawa sintetis. Fermentasi POC limbah tapioka dibantu *Effective Microorganism 4* (EM4) sebagai bioaktivator yang mampu meningkatkan kualitas pupuk dengan mengubah unsur hara agar mudah diserap oleh tanaman dan mampu mempercepat proses fermentasi bahan organik. Penelitian bertujuan untuk mengetahui pengaruh pemberian POC limbah tapioka dan mengetahui konsentrasi yang efektif terhadap pertumbuhan tanaman kangkung darat (*Ipomoea reptans* Poir.).

Penelitian menggunakan metode eksperimental dengan Rancangan Acak Lengkap, terdiri atas 4 perlakuan dan diulang sebanyak 6 kali. Parameter utama yang diamati adalah tinggi tanaman, jumlah daun, luas daun dan berat basah tanaman, sedangkan parameter pendukungnya adalah pengujian BOD, COD, TSS, Suhu, pH serta kadar unsur hara N dan P pada limbah tapioka sebelum dan sesudah difermentasi. Data pertumbuhan tanaman yang diperoleh dianalisis menggunakan ANOVA pada tingkat kepercayaan 95% dan hasil analisis berbeda nyata dilanjutkan dengan uji BNT (Beda Nyata Terkecil) pada tingkat kepercayaan yang sama.

Hasil penelitian menunjukkan bahwa pengaplikasian POC limbah tapioka dengan konsentrasi yang berbeda memberikan pengaruh terhadap pertumbuhan tanaman kangkung darat dengan penambahan konsentrasi 20%, tetapi hanya terlihat pada parameter jumlah daun dan luas daun yang disebabkan karena masih minimnya kadar unsur hara N dan P serta masih tingginya kandungan bahan organik sehingga belum memenuhi standar baku mutu limbah cair yang telah ditetapkan pada Peraturan Menteri Lingkungan Hidup Republik Indonesia Nomor 5 tahun 2014 Lampiran V tentang Baku Mutu Air Limbah Bagi Usaha dan atau Kegiatan Industri Tapioka.

**Kata kunci:** EM4, limbah tapioka, kangkung darat, pupuk organik cair, unsur hara.

## SUMMARY

The tapioca industry is an agroindustry sector that can't be separated from waste problems. The resulting waste causes pollution mainly caused by liquid waste. Tapioca wastewater, especially on household and small scales, is usually disposed of directly into the environment causing pollution such as foul odors, decreased river water quality, death of aquatic biota and discolored river water. Tapioca wastewater contains a lot of high enough organic components so that it can be processed into liquid organic fertilizer. Liquid organic fertilizer from tapioca wastewater has a high selling value and is environmentally friendly because it does not use synthetic compounds. Tapioca wastewater fermentation was assisted by Effective Microorganism 4 (EM4) as a bioactivator that was able to improved the quality of fertilizer by changing nutrients so that they are easily absorbed by plants and able to accelerate the fermentation process of organic matter. This study aims to determine the effect of liquid organic fertilizer from tapioca wastewater and determine the effective concentration on the growth of water spinach (*Ipomoea reptans* Poir.).

The study conducted an experimental method with a completely randomized design, consisting of 4 treatments and six repetitions. The main parameters was the plant growth there were plant height, number of leaves, leaf area and plant wet weight, while the supporting parameters were tests for BOD, COD, TSS, temperature, pH and the content of N and P in tapioca wastewater before and after fermentation. The plant growth data obtained were analyzed using ANOVA at the 95% confidence level and if significantly different it was continued with the LSD (Least Significance Defferent) test at the same confidence level.

The results showed that the application of liquid organic fertilizer form tapioca wastewater with different concentrations had an effect on the growth of land kale with an additional concentration of 20%, but this was only seen in the parameters of the number of leaves and leaf area due to the lack of nutrients N and P and still high organic matter content so that it does not meet the liquid wastewater quality standards set out in the Regulation of the Minister of Environment of the Republic of Indonesia Number 5 of 2014 Appendix V concerning Wastewater Quality Standards for Tapioca Industry Businesses and or Activities.

**Keywords:** *EM4, ground water spinach, liquid organic fertilizer, nutrients, tapioca wastewater.*