

**PENGARUH FERMENTASI DENGAN BAKTERI *Lactobacillus*  
TERHADAP TIMBAL (Pb) YANG DISEMPROTKAN PADA DAUN  
MURBEI YANG DIGUNAKAN SEBAGAI PAKAN CACING *Lumbricus*  
*rubellus***

**INTISARI**

Cacing *Lumbricus rubellus* mulai dilirik untuk pengobatan. Cacing ini diberi makan daun murbei yang telah disemprot dengan timbal (Pb) kemudian direndam dalam cairan pemfermentasi EM-4. Penelitian ini bertujuan untuk mengetahui apakah terdapat pengaruh fermentasi dengan bakteri *Lactobacillus* terhadap timbal (Pb) yang disemprotkan pada daun murbei.

Penelitian ini mengikuti rancangan penelitian eksperimental pola acak dengan menggunakan Spektrofotometer Serapan Atom (SSA).

Parameter validasi metode pada penelitian ini meliputi akurasi, presisi, linearitas, LOD, dan LOQ. Perolehan nilai rentang persen *recovery* dan %RSD pada konsentrasi 0, 2, 4, 6, 8, dan 10  $\mu\text{g/mL}$  adalah 82,4–102,75 % dengan %RSD 0,000–3,8678 %. Regresi linier yang diperoleh adalah  $y = 0,0141x - 0,0015$  dengan koefisien korelasi ( $r$ ) 0,9990. LOD yang diperoleh 0,1233  $\mu\text{g/mL}$  dan LOQ sebesar 16,872  $\mu\text{g/g}$ . Kadar timbal tertinggi pada daun 7.208  $\mu\text{g/g}$  dan kadar terendah 3,604  $\mu\text{g/g}$ . Sedangkan kadar timbal tertinggi pada air 0,4955  $\mu\text{g/mL}$  dan kadar terendah 0,1802  $\mu\text{g/mL}$ . Diketahui kadar timbal yang hilang sebesar 7.039,5  $\mu\text{g}$  pada penetapan kadar diduga karena timbal ikut tersedimentasi dalam cairan pemfermentasi akibat bakteri *Lactobacillus* dan terdapat perbedaan signifikan antara kadar timbal (Pb) pada daun terfermentasi dengan non-fermentasi.

Kata kunci : cacing, daun murbei, fermentasi, spektrofotometer serapan atom (SSA), validasi metode, kadar timbal.

**DETERMINATION OF IMPACT FERMENTATION WITH *Lactobacillus* BACTERIA ON SPRAYED LEAD (Pb) HEAVY METAL UPON MULBERRY LEAVES AS THE FOOD FOR *Lumbricus rubellus* WORMS**

**ABSTRACT**

*Lumbricus rubellus* as a variety of earthworm has increasingly become a prominent way of medication. This kind of worms have been fed with the mulberry leaves that previously has been sprayed with the lead (Pb) heavy metal and soaked in the fermented water in combination with the soluble EM4. This analysis wants to know about any certain impact of fermentation process with the *Lactobacillus* bacteria on the strawberry leaves after a spraying step with the lead (Pb) heavy metal.

This research has followed the rule of experimental design and has applied the method of random sampling system, whereas the atomic absorption spectro-photometry has also been installed with a comparison of acetylene flow versus air = 3:2 L/minute and the height of combustor is 1.2 cm.

A proper method of validation to its parametric values in this research has properly covered to its accurate value, its precision, linearity, the LOD, and the LOQ. Results of its findings show about a percentage of recovery span and the RSD with several concentrated levels of consecutively 0, 2, 4, 6, 8, and 10 µg/mL is 82,4-102,75 % with % RSD of 0.000-3.8678%. Its linear regression value is  $y=0,0141x-0,0015$  with a regression correlation coefficient ( $r$ ) of 0.9990. The value of LOD is 0,1233 µg/mL where LOQ is 16,872 µg/g. The highest rate of lead (Pb) heavy metal in the leaves is 7.208 µg/g and for the least one is 3,604 µg/g. Meanwhile in the mixed water have found that the highest one is 0,4955 µg/mL and for the least is 0,1802 µg/mL. In this process of determination analysis can be found that the content level of lead (Pb) has lost as much as 7.039,5 µg. It is supposed that the lead (Pb) has been sedimented by chance in the fermentation fluid because of the presence of the *Lactobacillus* bacteria. There is significant difference between the content of lead (Pb) in fermented leaves and another one without a fermented process.

**Keywords:** earthworm, mulberry leaves, fermentation, AAS (atomic absorption spectrophotometry), method of validation, level of lead (Pb) heavy metal.