



Growth Inhibition Test of Glyphosate Herbicide For Glyphosate-Degrading-Bacteria Screening

**Probo Condrosari^{1,2}, Aten Komarya³,
Hari Rom Hariyadi⁴, Reginawanti Hindersah⁵**

¹ Biotechnology Master Program, Postgraduate School, Universitas Padjadjaran
JI Dipati Ukur 35 Bandung, West Java, Indonesia 40132

² PT PupukKujangJIJenderal Ahmad Yani 39 Cikampek, Karawang, West Java,
Indonesia 41373

³ Agrotechnology Bachelor Program, Faculty of Agriculture, Universitas Padjadjaran
JI Raya Bandung-Sumedang km.21 Jatinangor, Sumedang 45363 West Java, Indonesia

⁴ Clean Technology Research Center, Indonesian Institute of Sciences
JICisitu Lama 21/154D, Bandung, West Java, Indonesia 40135

⁵ Faculty of Agriculture Universitas PadjadjaranJI Raya Bandung-Sumedang km.21
Jatinangor, Sumedang 45363 West Java, Indonesia

Abstract: Glyphosate is one of the most widely used herbicide for weed eradication. Excessive usage of glyphosate may lead to contamination of soil, water, and crops. Soil bioremediation using microorganisms to degrade glyphosate is an effective and cheap method when the level of glyphosate is higher than maximum permitted level. The resistance of the microorganism to glyphosate can be determined by observing IC₅₀ parameter. The microorganisms which are resistant to high concentration of glyphosate can be selected as candidate for glyphosate biodegradation process. The objective of this study was to determine IC₅₀ for consortium bacterial culture isolated from glyphosate-contaminated soil and uncontaminated soil. Generally IC₅₀ value is determined by measuring optical density, but in this study IC₅₀ value was determined using total number of cell to observe the real effect of glyphosate toward bacteria cell in the soil. Higher tolerance was observed for bacterial consortium culture isolated from uncontaminated soil (IC₅₀ is 263.38mg/L) compared with the culture from glyphosate-contaminated soil (IC₅₀ is 2.04 mg/L). Glyphosate at low concentration below 10 mg/L could increase bacterial growth. This study suggested that the bacteria could use low concentration glyphosate as nutrition source.

Keyword : Bioremediation, consortium culture, glyphosate tolerance, IC₅₀, natural consortium.