

**IDENTIFIKASI MOLEKULER DAN UJI KEMAMPUAN BAKTERI PEREDUKSI
SULFAT PENURUN KADAR SULFAT DAN MANGAN DALAM MEDIA
DIPERKAYA SERBUK GERGAJI**

Septi Kurniasih

16/404975/PMU/08862

INTISARI

Proses bioremediasi limbah asam tambang menghadapi masalah besar berkaitan dengan karakteristik lingkungannya. pH yang sangat rendah dan tingginya konsentrasi logam terlarut menjadikan sedikit organisme yang mampu bertahan. Salah satu kelompok yang mampu tinggal di lingkungan tersebut adalah bakteri pereduksi sulfat. Kelompok ini, hidup dengan memanfaatkan sulfat yang tersedia berlimpah di tempat tersebut sebagai akseptor elektron dan mereduksi banyak jenis logam. Penelitian ini merupakan penelitian lanjutan yang bertujuan untuk mengeksplorasi kandidat mikroorganisme yang dapat membantu proses bioremediasi limbah asam tambang yang diberikan sumber karbon tambahan berupa serbuk gergaji. Enam kultur murni bakteri pereduksi sulfat (SSK01, SSK02, SSK03, SSK04, SSK05, dan SSK06) dianalisis secara biokimia, fisiologi, dan genetika menggunakan gen 16s rRNA dan *dissimilatory sulphite reductase* (*dsrAB*). Kemampuan reduksi sulfat dilakukan dengan metode turbidimetri dan penurunan kadar Mangan terlarut diukur dengan AAS. Berdasarkan hasil analisis gen 16s rRNA, diketahui, strain SSK01, SSK03, SSK04, SSK05 dan SSK06 berkerabat dengan spesies *Desulfovibrio vulgaris*, sementara SSK02 berkerabat dekat dengan *Desulfovibrio aerotolerans*. Deteksi gen *dsrAB* menunjukkan satu strain positif memiliki gen *dsrAB*. Pemberian serbuk gergaji sebagai sumber karbon mampu mempercepat laju reduksi sulfat sebesar 81,76% dan pengendapan Mangan hingga 70,56%.

Kata kunci: bakteri pereduksi sulfat, 16s rRNA, gen *dissimilatory sulphite reductase*(*dsrAB*), serbuk gergaji, sulfat

**MOLECULAR IDENTIFICATION AND PERFORMANCE SCREENING OF
SULFATE REDUCING BACTERIA TO REDUCE SULFATE AND MANGANESE IN
SAWDUST ENRICHMENT BACTERIA**

Septi Kurniasih

16/404975/PMU/08862

ABSTRACT

The process of bioremediation of mine acid waste overcomes major problems related to the characteristics of its environment. Very low pH and high concentration of metals makes very limited organism which can survive. One group that is able to live in the environment is sulfate reducing bacteria. This group, living using sulfates available in this place as electron acceptors and reducing many types of metals. This research is a follow-up study aimed at discussing candidates for microorganisms that can help the process of bioremediation of mine acid waste given additional carbon sources including sawdust. Six pure sulfate reducing bacterial cultures (SSK01, SSK02, SSK03, SSK04, SSK05, and SSK06) were analyzed biochemically, physiologically, and genetically using 16s rRNA gene and so on. Sulfate reducing activity was analyze by turbidimetry method, an soluble metal concentration was monitored by AAS From the results of 16s rRNA gene analysis, it is known, the strains of SSK01, SSK03, SSK4, SSK05 and SSK06 are related to *Desulfovibrio vulgaris* species, SSK02 closely related to *Desulfovibrio aerotolerans*. Detection of *dsrAB* gene produces three positive strains having *dsrAB* gene. Sawdust enrichment as a carbon source can increase sulfate reducing activity up to 81.76% and the deposition of Manganese up to 70.56%.

Keywords: 16s rRNA, gene *dissimilatory sulphite reductase (dsrAB)*, sawdust, sulfate, sulfate reducing bacteria