ISOLASI MIKROORGANISME PELARUT FOSFAT DARI TANAH GUNUNG KAPUR SEMEN GRESIK

Vallen Martin
Pembimbing: (I) Dra. Mariana Wahjudi, M. Si.
(II) Ruth Chrisnasari, S. TP., M. P.

ABSTRAK

Fosfat merupakan unsur hara essensial yang dibutuhkan tanaman. Bentuk fosfat terfiksasi menjadi penyebab unsur fosfat tidak tersedia bagi tanaman dan menyebabkan fosfat menjadi permasalahan dalam pemberian pupuk fosfat. Berbagai mikroorganisme pelarut fosfat telah diisolasi dari tanah masam. Pada tanah masam, fosfat berikatan dengan aluminium dan besi, sedangkan pada tanah alkalin, fosfat berikatan dengan kalsium. Pada penelitian ini dilakukan isolasi mikroorganisme pelarut fosfat dari tanah alkalin yaitu tanah gunung kapur Semen Gresik dan dilakukan pengujian aktivitas pelarutan fosfat oleh isolat-isolat tersebut. Dari hasil penelitian diperoleh 8 isolat yang mempunyai aktivitas melarutkan fosfat. Kedelapan isolat tersebut mmpunyai bentuk koloni yang hampir sama yaitu berwarna putih dengan konsistensi padat berbubuk dan di bagian tengah terdapat titik pusat berwarna coklat. Kadar fosfat terlarut diukur dengan metode kolorimetri menggunakan spektrofotometer. Aktivitas pelarutan fosfat oleh isolat-isolat tersebut meningkat seiring dengan pertumbuhan sel hingga 92 jam waktu inkubasi yang diikuti oleh penurunan pH kultur pada media Pikovskaya cair. Kadar fosfat terlarut berkisar antara 115,484-308,387 ppm pada 76 jam waktu sampling. Dari 8 isolat tersebut, isolat 7 dan isolat 8 menunjukkan kadar fosfat terlarut terbesar yaitu 308,387 ppm dan 264,086 ppm setelah diinkubasi selama 76 jam. Pengamatan mikroskopik menunjukkan bahwa kedua isolat tersebut memiliki sel berbentuk batang yang tersusun bergandengan membentuk semacam hifa bercabang dengan ukuran diameter hifa yang kecil dan terdapat konidia pada ujung hifa. Kedua isolat tersebut diduga termasuk golongan *Actinomycetes*.

Kata kunci: Mikroorganisme pelarut fosfat, tanah gunung kapur Semen Gresik

ISOLATION OF PHOSPHATE SOLUBILIZING MICROORGANISMS FROM "TANAH GUNUNG KAPUR SEMEN GRESIK" SOIL

Vallen Martin
Supervisors: (I) Dra. Mariana Wahjudi, M. Si.
(II) Ruth Chrisnasari, S. TP., M. P.

ABSTRACT

Phosphate is one of the essential nutrients for plants. Phosphate is commonly found in soil in large quantity however it is present in the complex form, bind to the other compounds. In acid soil, phosphate binds to aluminium and iron whereas in alkaline soil it binds to calcium. Phosphate solubilizing microorganisms have been isolated from acid soil in several areas. The aims of this study were to isolate phosphate solubilizing microorganisms from Tanah Gunung Kapur Semen Gresik and to investigate the phosphate solubilizing activity of the isolate. Eight isolates were found which had activity to dissolve phosphate. All of them had similar colony morphologies. All colonies were white, powdery, hard consistency with brown spot in the middle. The concentrations of soluble phosphate were measured from cultures grown in Pikovskaya medium; the phosphate release was detected by a colorimetric method using a spectrophotometer. The phosphate released by all isolates was increased by the time during the cell growths until 92 hours incubation time, in the range of 115.484-308.387 ppm at 76 hours sampling times. The isolate 7 and 8 showed the greatest concentrations of dissolved phosphates which were 308.387 and 264.086 ppm respectively. The phosphate releases were corroborated with the decreases of pH of the cultures. Both isolates had similar microscopic phenotypes. The cells were rod, arranged in long chain structures resembling ti hifa, branched with conidia at the end of the hifa. The hifa size was smaller than fungi eventhough the structures were similar to fungi. The only differences between both isolates were the branches structures. It gave impression that both of them maybe belong to the *Actinomycetes* group.

Keyword: Phosphate solubilizing microorganisms, tanah gunung kapur Semen Gresik