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PROOF Correction on Atom Indonesia Journal for Author

Article ID : # 1590

Article Title : Isolation and Selection of Radiation Resistant Fungi from Mamuju High Natural Radiation Soil for Uranium and Thorium Bioremediation

Line Number	Original Text	Correction	Note / Change
	The results of molecular identification using the Sanger DNA Sequencing method with Capillary Electrophoresis provide important information about the specific identity of the three fungal isolates studied. Isolate A3 is similar to *Talaromyces flavus* isolate mf-1, isolate A4 is similar to *Gongronella butleri* isolate P1, and isolate F1 is similar to *Aspergillus sp.* isolate MEBP 0049, each with a similarity level of 100%. This perfect degree of similarity demonstrates the accuracy of the identification and provides a strong basis for further understanding of the characteristics and potential of each isolate.	The results of molecular identification using the Sanger DNA Sequencing method with Capillary Electrophoresis provide important information about the specific identity of the three fungal isolates studied, as summarized in Table 5. Isolate A3 is similar to Talaromyces flavus isolate mf-1, isolate A4 is similar to Gongronella butleri isolate P1, and isolate F1 is similar to Aspergillus sp. isolate MEBP 0049, each with a similarity level of 100%. This perfect degree of similarity demonstrates the accuracy of the identification and provides a strong basis for further understanding of the characteristics and potential of each isolate.	I have corrected the manuscript by mentioning Table 5 in the Molecular Identification Results section.
	Selection for fungal sensitivity to metals Based on the evaluation of microbial radiosensitivity, three isolates that showed survival at high radiation doses and had low inhibition were selected. The next process involved preparing a solution of uranium, thorium at a concentration of 10000 ppm in a 100 ml volumetric flask. For each treatment, 60 ml of Potato Dextrose Broth (PDB) was prepared containing eight different doses, for the two types of metals, and applied to three different isolates. Uranium used in the form of uranyl acetate (CH3COO)2UO2.2H2O, thorium nitrate (Th(NO3)4.5H2O). After preparation of 60 ml of PDB, a 1 ml sample of each solution was taken according to the prescribed treatment dose (0, 50, 100, 200, 400, 600, 800, 1000 ppm). All materials were sterilized, and the antibiotics were added to the Post-sterilized PDB. Then, uranium, thorium solutions	**Selection for fungal sensitivity to metals** Based on the evaluation of microbial radiosensitivity, three isolates that showed survival at high radiation doses and had low inhibition were selected. The next process involved preparing a solution of uranium, thorium at a concentration of 10000 ppm in a 100 mL volumetric flask. For each treatment, 60 mL of Potato Dextrose Broth (PDB) was prepared containing eight different doses, for the two types of metals, and applied to three different isolates. Uranium used in the form of uranyl acetate (CH3COO)2UO2.2H2O, thorium nitrate (Th(NO3)4.5H2O). After preparation of 60 mL of PDB, a 1 mL sample of each solution was taken according to the prescribed treatment dose (0, 50, 100, 200, 400, 600, 800, 1000 ppm). All materials were sterilized, and the antibiotics were added to the Post-sterilized PDB. Then, uranium, thorium solutions	I have corrected the manuscript by standardizing the units from “ml” and “liter” to “mL” and “L” throughout the text.

	were added according to the predetermined treatment doses. The solution was then poured into Petri dishes and allowed to solidify for one day. Isolates A3, A4, and F1 were prepared, cut into slices, and planted on PDA media that had been treated with metals. Fungal growth was observed for seven days.	were added according to the predetermined treatment doses. The solution was then poured into Petri dishes and allowed to solidify for one day. Isolates A3, A4, and F1 were prepared, cut into slices, and planted on PDA media that had been treated with metals. Fungal growth was observed for seven days.	
	Absorption of metals by selected fungi under gamma irradiated conditions The fungal isolate was mixed with 10 ml of NaCl solution, then rubbed using an ose and put into a 15 ml vial using a funnel. The number of spores was counted using a hemocytometer under a microscope. A total of 1 ml of spore suspension was put into a 50 ml vial containing 20 ml of Potato Dextrose Broth (PDB) medium and shaken at 100 rpm for 3 days. After incubation, 2.40 ml of culture was taken from a total of 20 ml of PDB and added to uranium and thorium solutions at a concentration of 400 ppm according to the treatment exposure times of 0, 4 hours, and 24 hours. The culture was then irradiated at IRPASENA (Iradiator Panorama Serbaguna) with a dose rate of 100 Gy for 4 and 24 hours. Empty bottles were prepared to hold the pellets and supernatants. The supernatant was separated and put into a glass vial, while the pellet was transferred into a 15 ml vial according to the exposure time treatment. The samples were centrifuged for 10 minutes at 5000 rpm, then the supernatant was transferred to a glass vial and the pellet to a 15 ml plastic vial. The pellets were oven-dried for 1 day, then weighed to calculate the biomass. The pellet condition was left open, while the pH of the supernatant was measured and then stored in the freezer. The absorption data were analyzed statistically using Microsoft Excel, where descriptive statistics were used to summarize the data, and graphs were generated to visualize trends in fungal absorption efficiency under different irradiation and metal concentrations.	**Absorption of metals by selected fungi under gamma irradiated conditions** The fungal isolate was mixed with 10 mL of NaCl solution, then rubbed using an ose and put into a 15 mL vial using a funnel. The number of spores was counted using a hemocytometer under a microscope. A total of 1 mL of spore suspension was put into a 50 mL vial containing 20 mL of Potato Dextrose Broth (PDB) medium and shaken at 100 rpm for 3 days. After incubation, 2.40 mL of culture was taken from a total of 20 mL of PDB and added to uranium and thorium solutions at a concentration of 400 ppm according to the treatment exposure times of 0, 4 hours, and 24 hours. The culture was then irradiated at IRPASENA (Iradiator Panorama Serbaguna) with a dose rate of 100 Gy for 4 and 24 hours. Empty bottles were prepared to hold the pellets and supernatants. The supernatant was separated and put into a glass vial, while the pellet was transferred into a 15 mL vial according to the exposure time treatment. The samples were centrifuged for 10 minutes at 5000 rpm, then the supernatant was transferred to a glass vial and the pellet to a 15 mL plastic vial. The pellets were oven-dried for 1 day, then weighed to calculate the biomass. The pellet condition was left open, while the pH of the supernatant was measured and then stored in the freezer. The absorption data were analyzed statistically using Microsoft Excel, where descriptive statistics were used to summarize the data, and graphs were generated to visualize trends in fungal absorption efficiency under different irradiation and metal concentrations.	I have corrected the manuscript by standardizing the units from “ml” and “liter” to “mL” and “L” throughout the text.
	Uranium metal sorption test A total of 1 ml of sample solution was	**Uranium metal sorption test** A total of 1 mL of sample solution	I have corrected the manuscript by standardizing the

	pipetted into a shake flask, then 2 ml of 5% ascorbic acid and 5 ml of 0.05 N TOPO solution were added. The solution was shaken for 2 minutes and left until the organic phase separated well from the aqueous phase. After separation, 2 ml of the organic phase was pipetted and put into a 25 ml volumetric flask. Next, 1 ml of complex II solution, 1 ml of pH 8.35 buffer solution, and 2 ml of 0.05% Bromo-PADAP solution were added. After 10 minutes, alcohol was added until the volume of the solution was exactly 25 ml. For the preparation of the blank, 2 ml of TOPO was pipetted into a 25 ml volumetric flask, and the same reagents as numbers 2 to 3 were added. Uranium complex solution with Bromo-PADAP was allowed to stand for at least 30 minutes, after which the absorbance was measured with a spectrophotometer at a wavelength of 574 nm.	was pipetted into a shake flask, then 2 mL of 5% ascorbic acid and 5 mL of 0.05 N TOPO solution were added. The solution was shaken for 2 minutes and left until the organic phase separated well from the aqueous phase. After separation, 2 mL of the organic phase was pipetted and put into a 25 mL volumetric flask. Next, 1 mL of complex II solution, 1 mL of pH 8.35 buffer solution, and 2 mL of 0.05% Bromo-PADAP solution were added. After 10 minutes, alcohol was added until the volume of the solution was exactly 25 mL. For the preparation of the blank, 2 mL of TOPO was pipetted into a 25 mL volumetric flask, and the same reagents as numbers 2 to 3 were added. Uranium complex solution with Bromo-PADAP was allowed to stand for at least 30 minutes, after which the absorbance was measured with a spectrophotometer at a wavelength of 574 nm.	units from “ml” and “liter” to “mL” and “L” throughout the text.
	Thorium metal sorption test First, tools and chemicals were prepared. A 0.1% Thorin solution was made by dissolving 1 gram of Thorin in 1 liter of HCl, pH 0.8. A 5% ascorbic acid solution was made by dissolving 5 g of ascorbic acid in 100 ml of distilled water. HCl pH	**Thorium metal sorption test** First, tools and chemicals were prepared. A 0.1% Thorin solution was made by dissolving 1 g of Thorin in 1 L of HCl, pH 0.8. A 5% ascorbic acid solution was made by dissolving 5 g of ascorbic acid in 100 mL of distilled water. HCl pH	I have corrected the manuscript by standardizing the units from “ml” and “liter” to “mL” and “L” throughout the text.

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