

Indigenous Microorganism Collection, Culturing, and Application

Collection materials needed

- a small wooden box, 12 x 12 x 4 inches deep, preferably made of cedar
- steamed white rice
- white paper towels, enough to cover the wooden box
- two to four large rubber bands
- a sheet of clear plastic, large enough to completely cover the wooden box
- 1/4-inch mesh wire screen large enough to completely cover the wooden box.

Assembly of collection materials

(1) Fill the wooden box with 3 inches of steamed rice. (2) Cover the box with white paper towel, being careful not to let the towel touch the rice. There should be an inch or so of air space between the rice and the paper towel. (3) Use rubber bands around the top of the box to secure the paper towel in place. (4) Cover the top of the box with wire screen to prevent animals from tampering with the rice. (5) Top the wire with a sheet of clear plastic to protect the box from rain, and place it under trees or in another secluded area. The box should not be in direct sunlight. (6) Partially bury the box in the soil. It should be buried at least 2 inches deep for best results. (7) Cover the box with fallen leaves from the harvest location. (8) Anchor the plastic sheet on all sides with small rocks to prevent it from being dislodged by wind. (9) Leave the box undisturbed for a minimum of 4–5 days. After that time, check to see whether the moist rice is covered with white mold. (10) If mold growth is sparse, re-cover the box and wait an additional 2–3 days before re-checking. (11) If the mold is a color other than white (other colors indicate growth of less effective fungi) or if rain has entered the box, the contents should be discarded and the process repeated.

Culturing materials needed

- a clean clay pot (hard-fired, glazed, or terra cotta)
- a wooden spoon
- white paper towels
- rubber bands
- a large clear bowl, big enough to hold contents of rice mixture
- a small food scale
- a straw mat
- a shovel
- a composting thermometer
- raw, granulated brown sugar
- wheat mill run** or, if available, mushroom growth medium waste.

**Wheat mill run (WMR) is the materials remaining after flour, or semolina, is extracted from wheat or durum during milling.

Assembly of culturing materials

(1) Weigh and record the weight of the large bowl. (2) Use the wooden spoon to move the molded rice from the wooden box into the bowl. Weigh the filled bowl and calculate the weight of the rice mass by subtracting the weight of the empty bowl from the filled bowl. (3) Gradually add an amount of granulated brown sugar equal to the weight of the rice mass. Handknead the sugar and rice until the material has the consistency of goey molasses. Protective gloves are suggested. (4) Fill the clean clay pot two-thirds full with the rice/ sugar mixture. Cover it with paper towel secured in place with rubber bands. (5) Store the pot in a cool area away from direct sunlight for 7 days. This will allow the mixture to ferment. (6) Working in a shaded area, add a small amount of water to the fermented rice mixture in a 1:500 ratio. Then, slowly blend in wheat mill run (or used mushroom medium) until mixture is of semi-moist but not wet consistency (roughly 65–70% moisture).

Activation of culturing process

(1) Place a mound of the mixture on a soil surface and cover it with the straw mat or leaves, protecting it from sunlight. Allow the microbes to propagate for 7 days. Periodically examine the external surface of the pile for white mold growth, monitor internal temperature of the pile with a composting thermometer so as not to exceed 122°F (50°C), and turn the pile with a shovel (a minimum of three to four times during the week) to keep fermentation temperatures from getting too high. (2) When the fermentation process is finished, internal temperature will stabilize, indicating cultivation is finished. The culture of naturally occurring microorganisms is now ready for use.

Application of cultured microorganisms

Dilute the final product (1 to 1 by volume) with soil and incorporate this mixture into the surface soil as a topdressing for crop production, or add it to your compost pile. This biological soil amendment is expected to augment and enhance soil microorganism activity.