Cultivating *Cordyceps militaris* is a fascinating process. In the wild, it is an entomopathogenic fungus, meaning it parasitizes and grows out of insects. Fortunately, for modern cultivation, it has been adapted to grow exceptionally well on a vegan or semi-vegan grain-based substrate, avoiding the need for insect hosts.

Unlike most wood-decaying mushrooms that are grown in bags, *Cordyceps militaris* is typically grown in jars or plastic tubs where it fruits directly upwards from the substrate.

Below is a detailed Standard Operating Procedure (SOP) for cultivating *Cordyceps militaris* indoors.

Phase 1: Materials and Equipment Needs

- **Culture:** A proven, high-quality *Cordyceps militaris* liquid culture (LC). *Note: Cordyceps cultures can senesce (age and lose fruiting ability) quickly, so acquiring a vigorous, commercial-grade LC is crucial.*
- **Substrate Base:** Long-grain brown rice or white rice.
- **Nutrient Broth Ingredients:** Distilled water, malt extract or dextrose, nutritional yeast or yeast extract, and peptone. (Some growers add a small amount of kelp powder or silkworm pupa powder for extra yields, but a vegan broth works perfectly).
- **Containers:** Wide-mouth, straight-sided glass mason jars (pint or quart size) or autoclavable PP5 plastic tubs. The lids must have a 0.2-micron syringe filter or a synthetic filter disc for gas exchange.
- **Sterilization:** Pressure cooker or autoclave.
- **Inoculation Environment:** Laminar flow hood or Still Air Box (SAB).
- **Fruiting Environment:** A temperature-controlled space with artificial lighting (LEDs).

Phase 2: Nutrient Broth and Substrate Preparation

Cordyceps cannot thrive on rice alone; the rice acts as a physical sponge for a nutrient-rich liquid broth.

1. **Prepare the Nutrient Broth:** A standard recipe for 1 liter of water includes:
    - 20g Light Malt Extract (or Dextrose)
    - 10g Nutritional Yeast (or Yeast Extract)
    - 5g Peptone
    - Mix the dry ingredients into 1 liter of warm distilled water and stir until fully dissolved.
2. **Load the Containers:**
    - Add **30 to 40 grams of dry rice** into each glass jar.
    - Pour **45 to 60 ml of the nutrient broth** into each jar directly over the dry rice. (The ratio is generally 1 part dry rice to 1.5 parts nutrient liquid by weight/volume).
3. **Sterilization:** Place the lids on the jars (ensuring the filter patches are secure). Load the jars into a pressure cooker and sterilize at **15 PSI (121°C) for 60 minutes**.
4. **Cooling:** Allow the pressure cooker to naturally depressurize and let the jars cool completely to room temperature. The rice will have cooked and absorbed most of the broth.

Phase 3: Inoculation

Cordyceps is susceptible to bacterial and mold contamination during the liquid culture stage, so maintain strict sterility.

1. **Sanitize:** Clean your hands, workspace, and the liquid culture syringe with 70% isopropyl alcohol.
2. **Inoculate:** In front of a flow hood or inside a SAB, inject **5 to 10 cc (ml) of liquid culture** directly into each jar. Try to spray the liquid evenly across the surface of the rice.
3. **Seal:** If your jars have self-healing injection ports, simply pull the needle out. If you opened the lid slightly to inject, close it tightly immediately.
4. **Do Not Shake:** Unlike grain spawn for other mushrooms, **do not shake the jars**. The liquid culture should sit on the surface of the rice.

Phase 4: Incubation (The Dark Phase)

1. **Environment:** Place the inoculated jars in total darkness (e.g., a closed cabinet or a blacked-out shelf).
2. **Temperature:** Maintain a cooler temperature between **65°F and 68°F (18°C–20°C)**. Cordyceps prefers cooler temperatures than most tropical mushrooms.
3. **Duration:** Incubate in the dark for **7 to 14 days**.
4. **Observation:** The mycelium will rapidly colonize the surface of the rice, turning it into a solid, brilliant white mat. Towards the end of the dark phase, the mycelium may start to turn slightly yellow or pale orange.

Phase 5: Fruiting (The Light Phase)

Cordyceps requires a specific light cycle to trigger the formation of its bright orange fruiting bodies.

1. **The Light Trigger:** Move the fully colonized jars onto a shelving unit equipped with daylight-spectrum LED lights (6500K color temperature).
2. **Lighting Cycle:** Provide exactly **12 hours of light and 12 hours of darkness** daily.
3. **Environment:** Keep the jars sealed. Do not open the lids. The jars act as individual humidity domes. Keep the ambient room temperature strictly between **65°F and 70°F (18°C–21°C)**. Temperatures above 75°F (24°C) will often cause the pins to abort or deform.
4. **Growth:**
    - Within 1 to 2 weeks of light exposure, the mycelium will turn a vibrant, deep orange.
    - Shortly after, small orange bumps (pins) will form on the surface.
    - Over the next 3 to 5 weeks, these pins will elongate into the classic, club-like Cordyceps fruiting bodies.

Phase 6: Harvesting and Drying

The entire process from inoculation to harvest takes about **60 to 75 days**.

1. **When to Harvest:** The Cordyceps are ready to harvest when the clubs are fully elongated and the tips become slightly bulbous and covered in tiny, pimple-like bumps (these are the perithecia, where the spores are produced).
2. **How to Harvest:**
    - Open the jar in a clean environment.
    - Use a sterilized, long-handled scalpel, knife, or curved scissors to cut the orange clubs off as close to the substrate base as possible.
    - *Alternative:* You can pull the entire substrate block out of the jar and harvest the mushrooms from the outside, which is often easier.
3. **Substrate Use:** The remaining orange mycelial block (the colonized rice) is completely edible and highly medicinal. Many commercial growers dry this biomass and sell it or use it in extractions alongside the fruiting bodies.
4. **Drying:** Place the harvested fruiting bodies (and the substrate, if kept) in a food dehydrator at **120°F–130°F (49°C–54°C)**. They dry very quickly. Once cracker-dry, store them in airtight glass jars out of direct sunlight.