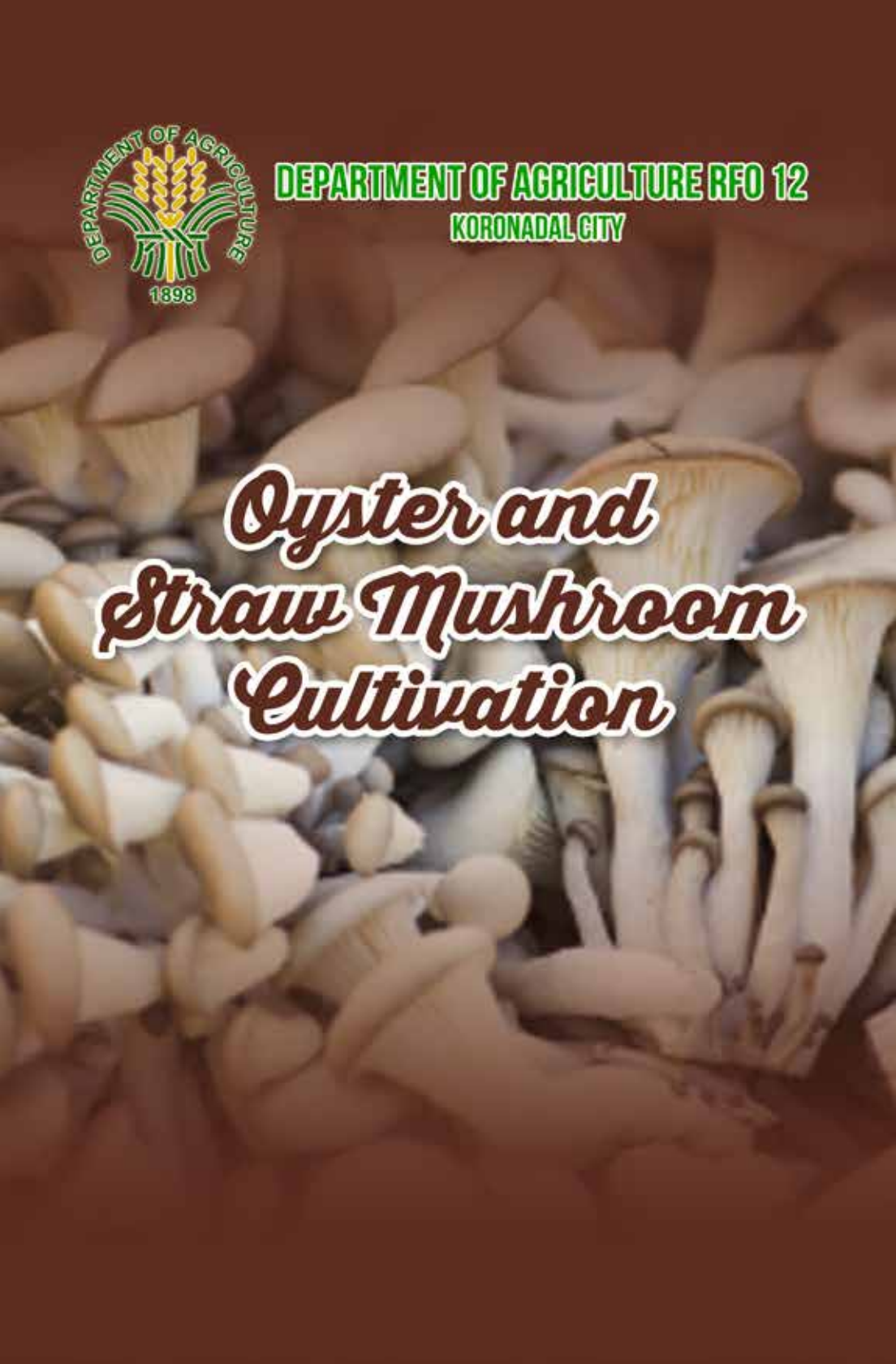

DEPARTMENT OF AGRICULTURE RFO 12
KORONADAL CITY
Oyster and
Straw Mushroom
Cultivation

Foreword

Ang kabute ay isanguri ng amag na tumutubo at lumalaki sa mga nabubulok na organikong bagay. Ito ay nakakain at mayaman sa mga bitamina at mineral tulad ng essential amino acids, fats, carbohydrates, fiber, protein, calcium, thiamine, riboflavin, iron at niacin.

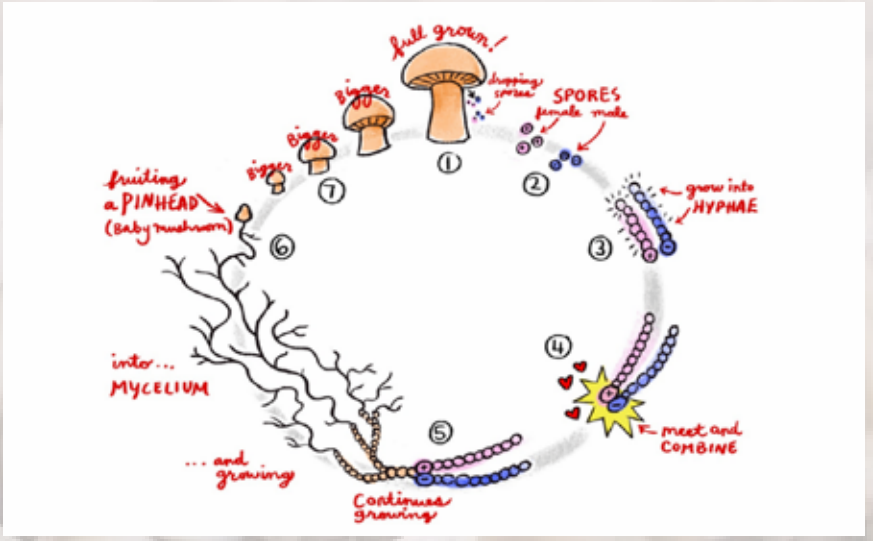
Ang mga kabute ay kilalang karne s amundo ng mga gulay ngunit sa katotohanan, hindi sila tunay na gulay saka dahilan ang wala silang mga dahon, ugat o buto at di nila kailangan ng sikat ng araw para sila ay lumaki.

Ilan lang sa mga uri ng kabute na tumutubo sa Pilipinas ay ang kabuteng pamaypay (oyster mushroom), kabuteng dayami (straw mushroom), tengangdaga (brown mushroom), buttom mushroom, shiitake mushroom at marami pang iba.

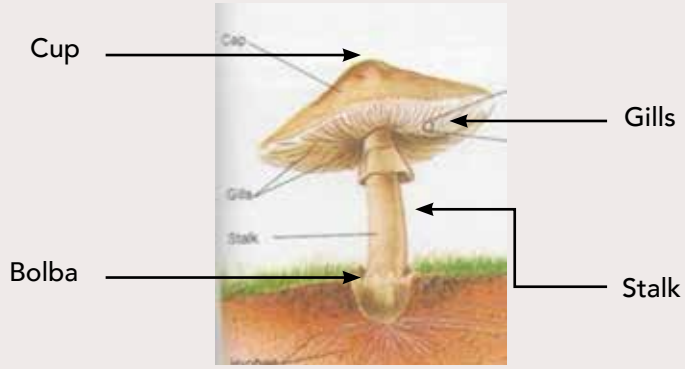
Ayon sa Food and Agriculture Organization, 90% ng kinukunsumong kabute sa Pilipinas ay inaangkat pa mula sa mga kalapit bansa sa Asya at ang natitirang 10% ay ang bilang lamang ng kabuteng napo-produce ng ating bansa.

Ang gabay na ito ay ginawa upang maipakilala ang potensyal ng kabute sa negosyo at makapagbigay ng kabuhayan o dagdag kita sa tulong ng mura at alternatibong teknolohiya sa pagpapalaki ng kabute na galling mula sa eksperto galling sa Kagawaran ng Pagsasaka.

Mushroom Life Cycle



- Ang kabute ay isang bunga ng amag



Parts of a Mushroom

MAHALAGANG TERMINO

SPORE - Ito ang binhi o butong kabuteng matatagpuan sa hasang (gills)nito.
HYPHA - (PL. HYPHAE) Ito ang pangunahing unit ng mycelium na tumutubo sa spore.

MYCELIUM - (PL. MYCELIA) Ito ang ugat at katawanng kabute na siyang lumalago at sumisipsip ng pagkain mula sa substrate.

SUBSTRATE - Mga bagay na sinisibulan ng kabute.

PRIMODIA - Maliliit na butil nasinlaki ng ulong aspile (pinheads) na siya ng nagiging bunga or kabute paglaki.

FRUITING BAGS - Ginawang patubuan ng wood rotten type ng kabute.

CULTURE MEDIA - Patubuan ng purong binhing kabute. Kadalasan ito ay nasa test tube o flat rhum bottle.

PANGKALUSUGANG KAPAKINABANGAN NG KABUTE

PROTINA 3.0% ng sariwang timbang19.35% ng tuyong timbang
AMINO ACIDS Taglay nito ang kinakailangang siyam na amino acid ng ating katawan.
TABA 0.6%-3.0% laman ng tuyong timbang
BITAMINA B-complex, provitamin-D2 at Vitamin C
MINERAL 56-70% ng ash content
FIBER 7.4-27.6%
NUCLEIC ACID 4.0% laman ng sariwang tubig

MEDISINAL NA MGA KATANGIAN NG KABUTE

- Nakapagpapalakas at nakadaragdag ng natural na resistensiya ng pasyente.
- Pinasisigla at binubuhay ang mga natutulog na ugat.
- Pinasisigla ang pagdaloy ng dugo

Isa sa mga pinaka popular na kabuteng medicinal ay ang Ganodermalucidum. Nakakagaling ito o nakakabawas ng:

- Sign of hypertension
- Hypotension
- Arteriosclerosis
- Menopause
- Constipation
- Hydrosis (edema)
- Brain stroke
- Hepatitis
- Hemorrhoids
- Low back pain, varix
- Gastric at duodenal ulcer
- Autoimmune diseases (collagen disease)

MAJOR PHASES IN MUSHROOM CULTIVATION

The major practical phases of mushroom cultivation are:
a) Selection of an acceptable mushroom variety
b) Pure culture preparation
c) Production of "seed" known as spawn
d) Preparation of substrate materials for fermentation/composting
e) Mycelia (spawn) running – incubation period
f) Mushroom development – cropping/fruiting

CONSIDERATIONS FOR SITE SELECTION OF GROWING MUSHROOM

The following factors should be kept in mind when selecting a site for mushroom farm:

a. Distance to market
b. Availability of substrate materials
c. Transportation of both product and substrate materials
d. A lay-out to prevent contamination on the farm
e. Climatic conditions have to suit the cultivated mushroom
f. Availability of water

Some climatic control can be achieved by shielding the substrate from outside conditions. The growing area should provide suitable environmental conditions:

a. Temperature
b. Humidity
c. Ventilation
d. Sufficient light

Basic Laboratory Activities for Mother Culture and Spawn Production

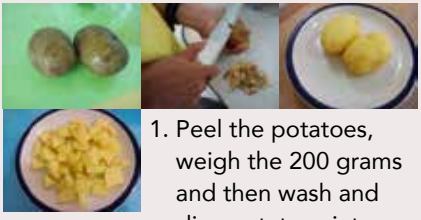
A.) Preparation of Culture Media/ Potato Dextrose Agar (PDA)

Materials:

Potato	200 grams
Dextrose powder or White refined sugar	20 grams
Agar powder or white gulaman bar	20 grams
Distilled or tap water	1000 ml

Casserole; weighing scale; Ladle, Strainer (cheese cloth) and Funnel

Procedure



1. Peel the potatoes, weigh the 200 grams and then wash and slice potatoes into cubes.

2. Boil the sliced potatoes in a liter of water until soft enough to be eaten.

3. Strain and collect the decoction.

4. Restore the volume of the decoction into 1 liter again.

5. Return the decoction in casserole and bring to boil. Add the 20 grams agar, stirring it constantly until the agar is dissolved.

6. Stir in the 20 grams of dextrose powder. Turn-off the fire after adding the dextrose powder.

7. Pour 40ml of the liquid medium in each flat rhum bottle. Do not wet the mouth of the test tube or rum bottle with the medium so that the cotton plug will not stick, use funnel to avoid this. Plug bottle mouth with cotton. The cotton should not be tight or too loose. Cover the cotton plug with clean paper not to wet the cotton plug during sterilization. Test tube can be used as well if available.

8. Arrange the flat rum bottles inside the sterilizer such as autoclave or pressure cooker or ordinary high casserole.

9. Sterilize the bottled medium in an autoclave or pressure cooker at 15 pounds pressure for 45 minutes. If an improvised sterilizer is used, like casserole

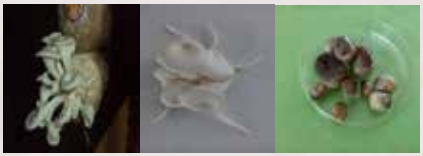
10. Immediately after sterilization, slant the bottles or test tubes making sure that the agar does not touch the plug. Allow the agar slant to cool and solidify then arrange the bottles in upright position.

B.) Pure/ Mother Culture Production (Tissue Culture Method)

Materials Needed:

1. Potato Dextrose Agar (PDA) or Rice-wash Dextrose Agar (RDA)
2. Tissue paper (interfolded)
3. Scissors, blade or scalpel
4. Forceps/ Inoculating needle or micro spatula
5. Freshly collected mushroom
6. Alcohol lamp
7. Alcohol / Ethanol 95%
8. Inoculating chamber / inoculating table
9. Pressure cooker or drum

Procedure



1. Collect healthy and fresh mushrooms.

2. Cut or tear the mushroom half or/ at the center

3. Using the inoculating needle or forceps, pinch a small tissue from the neck/ center portion of the fresh mushroom.

4. Inoculate in PDA / RDA/SPDA.

5. Incubate for 1 to 2 weeks.

6. Subculture after 2 weeks.

C.) Sub Culture Process

1. Active Pure Culture/Mother Culture (Fo) (pleurotus spp./ Volvariellavolvaceae)
2. PDA or RDA
3. Alcohol lamp
4. Inoculating needles
5. Inoculating chamber

Procedure:

1. Select active pure cultures of pleurotussp or volvariellavolvaceae.

2. Prepare pure culture of mushroom species, culture media slants (PDA / RDA), alcohol, transfer needles, alcohol lamp and lighter in the inoculation chamber or laminar flow.

3. Inside the inoculating chamber, with the alcohol lamp, flame the transfer needle, remove the cotton plug of the pure culture and flame the mouth of the bottle, insert the transfer needle and slice/get a little of the pure culture,return the cotton plug. In the same manner, get a PDA slant, unplug the cotton plug and flame the bottle's mount and plant the slice pure culture in the slant. Return the cotton plug, the paper cover and tie with rubber bond.

4. Incubate for 7 to 14 days.

D.) Preparation of grain spawn (for oyster mushroom)

Materials

1. Sorghum seeds (cracked corn kernels, rice grain or mongo seeds can also be used as alternate substrates)
2. Clean bottles (catsup bottles), polypropylene bags can also be used.
3. Pure culture of Oyster mushroom (Pleurotus sp.), Straw mushroom (Volvariellavolvaceae)
4. Cotton waste, rubber bond, used paper
5. Pressure cooker or drum for sterilization

Procedure

1. Clean and wash sorghum or cracked corn or rice grain.

2. Weigh the desired amount of substrate to be used.

3. If sorghum- cook for 20-25 minutes, if cracked corn, cook for 4-5 minutes for and for rice 40 minutes.

4. Drain the cooked sorghum or cracked corn or rice grains in manila paper or white cloth.

5. Put /stow the cooked substrates in the prepared bottles or in polypropylene bags at 100 to 150 gm. each.

6. Plug with cotton or cotton waste, cover with paper, and tie with rubber bond.

7. Sterilize bottles or bags with substrates at 15 psi for 30 minutes.

8. Let cool and store in inoculation room.

9. When cold inoculate the pure culture or sub-culture of oyster mushroom.

10. Incubate for 7 days to allow the mycelia to colonize or ramify in the substrates.

11. Fully colonized cracked corn/ sorghum is ready for planting in the fruiting bags and/or for distribution at 14 to 21 days).

Preparation of planting spawn (for straw mushroom / Volvariellavolvaceae)

Materials Needed:

1. Dried leaves (banana, rice straw, mungo pod-peel)
2. Saw dust
3. Rice bran (tiki-tiki)
4. Water
5. Basin, pail
6. Polypropylene bags (6 X 8 X 0.002; 6 X 12 X 0.002)
7. Rubber bond
8. Pressure cooker or sterilization drum
9. Pure culture or sub-culture or grain spawn of volvariellavolvaceae

Procedure

1. Mix any of the following ratio:

   a. 3 part sawdust: 1 part mongo pods or any dried legume pods
   b. 3 parts sawdust: 1 part tobacco midrib
   c. 3 parts sawdust: 1 part chopped banana leaves and 1 part rice bran
   d. 9 parts rice hull: 1 part rice bran
   e. 3 parts sawdust: 1 part rice straw and 1 part rice bran
2. Note: If sawdust and tobacco midrib will be used, these should be pre-fermented for 14 days to remove toxic compounds especially the tobacco midrib.
3. In case of rice hull, soak overnight then rinse before using.
4. Other materials such as dried legume pods, chopped banana leaves and rice straw should be for soak 3 hours.
5. Drain the soak materials. Use of net is recommended to remove excess water easily.

6. Combine and mix materials of your choice ratio or combination above. Add water up to 60-65%.
7. Bottle the mixture or place in a heat resistant bags (polypropylene). Do not compact the material when filling the bottle or plastic bag. Cover the bottles with aluminum foil or paper. Secure with rubber band. If plastic bag is used, use cotton waste plug and secure the bag with a paper and rubber band.
8. Sterilize the bottled or bagged substrate at 15 psi (pound per square inch) for 1 hour if autoclave or pressure cooker is used. If drum or casserole will be used, sterilize the substrate for 3-4 hours.
9. Cool the sterilized substrate.
10. Bring the cooled bottled or bagged substrate in the inoculating chamber or room. Carefully open the bottled or bagged substrate and inoculate with mother spawn straw mushroom grain spawn or straw mushroom.
11. Cover the bottle or bag and set aside. Inocubate for 7 to 10 days.
12. Whitish to pinkish mycelia will be seen at this stage. The spawn is now ready for planting, in the bed (usually within a period of 14 days after inoculation).

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