



## **DEPARTMENTAL ACTIVITIES**

- ❖ **MUSHROOM CULTIVATION**
- ❖ **AZOLLA FARMING**
- ❖ **HERBAL PLANT GARDEN**
- ❖ **MEDICINAL PLANT GARDEN**

## MUSHROOM

The edible fungus is generally known as Mushroom. It is a fleshy, spore bearing fruiting body of a fungus typically produced above ground on soil or on its food source. Like other fungi, it does not contain chlorophyll and has to depend on food prepared by another organism for nutrition. Therefore, it grows alone on dead organisms or in symbiosis with other organisms.

### CLASSIFICATION OF MUSHROOM:-

#### 1. Edible Mushroom:

A. Oyster mushroom (*Pleurotus ostreatus*)

B. Paddy straw mushroom (*Volvariella volvacea*)

C. White button (*Agaricus bisporus*)

2. NON- EDIBLE (TOADSTOOL)– The poisonous mushroom is known as Toadstool.

A. *Amnita phalloides*

B. *Amnita muscaria*

C. *Amnita pantherina*

D. *Amnita citrina*

### CULTIVATION PROCESS -:

There are 6 main steps involves in mushroom cultivation

**1. PHASE I COMPOSTING**– There are two types of compost –

**A. NATURAL COMPOST**– It is made of raw materials like Straw, Horse manure, Poultry manure etc.

**B. SYNTHETIC COMPOST**–It is made of raw materials like bran, straw, urea, calcium ammonium nitrate or ammonium sulphate and gypsum etc.

In phase 1 composting we made compost by mixing and wetting the raw material. Once the material is wet and aerobic fermentation starts as result of the growth and reproduction of microorganism. Phase 1 composting takes at least 5-18 days for this compost to be ready and in how many days it will be completely ready depends on the raw material.



**2. PHASE II COMPOSTING**– The main focus of phase 2 composting is pasteurization and removal of ammonia which formed during phase 1.

Concentration higher than 0.7 is dangerous to mycelium spawns growth, so this is important to remove ammonia. 125°F to 130°F is the most perfect temperature because de-ammonifying organism grow well in this range. At the end of phase 2 the temperature should be approximately 75°F to 80°F. The nitrogen content should be 2.0 to 2.4 % and moisture content should be 68 to 72%.

**3. SPAWNING**– The process of sowing Mushroom mycelium into the prepared beds is generally known as spawning. We can do spawning in two ways by dispersing the compost on the trays or mixing the grain spawn with compost before filling the trays. Once the spawning is done we cover the trays with newspaper and then sprinkle some water to maintain moisture content.

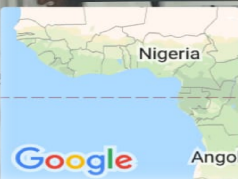
**4. CASING**– When we mix finely crushed rotten cow dung with garden soil that is called casing soil. In this pH should be on the alkaline side. The casing soil has to be well sterilized and capable to kill the harmful insect, nematodes, pest etc. By treating the soil with Formalin solution or by steaming we can sterilize it. The casing soil requires lots of air. After spreading is done the temperature should be maintained at 25°C for 72 hours.



**5. PINNING**– The pin develops when the CO<sub>2</sub> content of the room is less than 0.08%. Mushroom occurring at the beginning develops after Rhizomorph have formed. The newly formed mushroom is very small. The timing of fresh air to introduce in the room is very important. Prevent the air to enter in the room until the mycelium has begun to show at the surface of the casing. Stop watering the casing when the pin initial starts forming.

**6. HARVESTING**– We reap the mushroom into” Flushes”

The first flush is reaped in 3 to 5 days and gets the yield of 15 to 20 kg/m<sup>2</sup>. The second flush is reaped in 5 to 7 days and gets the yield of 9 to 11 kg/m<sup>2</sup> a little less than first flush. We get about 27 to 35 kg total yield.



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**HAND-PICKING MUSHROOMS CAN BE STORED AND CONSUMED FRESH.**



## AZOLLA FARMING

Azolla is a nature's gift for rice cultivation and has tremendous other agricultural uses. It is one of the most nutritive animal feed and also a source of green manure. Moreover it is also an excellent biofertilizer too.

Azolla has several times higher level of crude protein than other forage crops and is also rich in mineral nutrients. Despite its benefits this commonly available water fern is in disguise due to lack of knowledge among farming community.

Azolla is a floating aquatic pteridophyte (a fern) with symbiotically associated nitrogen fixing cyanobacteria (*Anabaenae azollae*). In fact it often forms green or red mats in water bodies and also has names as 'duckweed' and 'fairy moss'

Six species of Azolla are there viz:- *A. carolina*, *A. filiculoides*, *A. mexicana*, *A. microphylla*, *A. nilotica* and *A. pinnata*. Out of these *Azolla pinnata* is very common and good yielder in tropical climates.

The plants are visible as clusters of small leaf floating in ponds, wet fields, rice field and drains. While their fibrous roots floats underneath of the water.



## USES OF AZOLLA

### **GREEN MANURE**

Use of Azolla as green manure

Azolla can be used to increase rice yield by several folds at comparatively low cost and less labour. They are grown in a part of field and are transferred in the whole field, before or after transplanting.



### **FISH MANURE**

It is highly nutritious and cheap source of fish feed with high protein content. The green plants are grown in a section of pond by separating with a net from fishes. Afterwards they are released at intervals for this fishes to eat.

### **PIGGERY AND POULTRY SUPPLEMENT**

Being a rich source of proteins and amino acids they are often used as a feed supplement. However it is not only limited to poultry and pigs this feed is used for other livestock also.





### **DAIRY FEED**






Mixing some amount of dairy feed with Azolla enriches the nutritional value of feed. Moreover direct feeding of livestock with green Azolla in dry seasons is also a good practice.





### **BIOFERTILIZER**






Being capable of symbiotic nitrogen fixation Azolla is an excellent biofertilizer. In fact in different researches it was found that the yield of rice was increased by 20-30% when incorporated with Azolla cultivation.





## MEDICINAL AND HERBAL PLANT ARENA



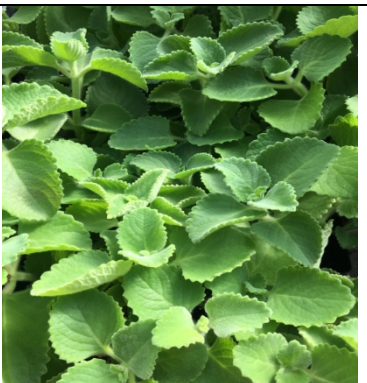

Sl. No.	Botanical name	Common name	Medicinal use	Picture
1.	<i>Aloe barbadensis miller</i>	Aloe vera	It treats skin problems and shows therapeutic properties including anticancer, antioxidant, antidiabetic, and antihyperlipidemic.	
2.	<i>Ocimum sanctum</i>	Tulsi	It counteract metabolic stress and psychological stress, normalizes the blood glucose, blood pressure and lipid levels, has positive effects on memory, anti-depressant.	
3.	<i>Andrographis paniculata</i>	Nilavembu	It helps to manage blood sugar levels and is useful for diabetic patients & control all kinds of fever including dengue, typhoid, influenza, malaria and chikungunya, also fight cancer and detoxifies the liver.	
4.	<i>Elettaria cardamomum</i>	Cardamom or Elaichi	It has antioxidant properties, reduces High Blood Pressure, Corrects Digestive Ailments, Fights Bad Bacteria & Relaxes, Post-Surgery Recovery, Soothes and Reduces inflammation.	






5.	<u>Emblica officinalis</u>	Amla	It is an anti oxidant, anti-inflammatory, anti cancer , anti-diabetic, prevents hyperlipidemia, osteoporosis and several other ailments.	
6.	<u>Saraca asoca</u>	Ashok	It manages skin related problems & maintain clearer skin by removing toxins from the body due to its antioxidant properties, helps in managing cancer, diabetes, piles, ulcers, worm infestation, fever, etc.	
7.	<u>Bacopa monnieri</u>	Brahmi	It reduce inflammation & boost brain function, help reduce ADHD symptoms & also prevent anxiety and stress, help in lowering blood pressure level & have anticancer properties.	
8.	<u>Santalum album</u>	White Sandal wood	It has antipyretic, antiseptic, antiscabetic, and diuretic properties, effective in treatment of bronchitis, cystitis, dysuria, and diseases of the urinary tract.	
9.	<u>Nardostachys jatamansi</u>	Jatamansi	It is included in dietary supplements, treat epilepsy, hysteria, syncope, convulsions, and mental weakness.	






10.	<u>Curcuma longa</u>	Turmeric	It is extensively used in Ayurveda, Unani and Siddha medicine as a home remedy for various diseases including biliary disorders, anorexia, cough, diabetic wounds, hepatic disorders, rheumatism, and sinusitis.	
11.	<u>Piper longum</u>	Long pepper	It is used to improve appetite and digestion, treat stomachache, heartburn, indigestion, intestinal gas, diarrhea, cholera, used for lung problems including asthma, bronchitis, and cough.	
12.	<u>Solanum nigrum</u>	Makoi	It is used for stomach irritation, cramps, spasms, pain, and nervousness, treats psoriasis, hemorrhoids, abscesses, inflammation, burns, and ulcers.	
13.	<u>Crocus sativus</u>	Saffron, Kesar	It treats depression & fights cancer, act as an aphrodisiac, aid weight loss, reduce heart disease risk factors, lower blood sugar levels, improve memory in adults with Alzheimer's disease.	





14.	<u>Asparagus racemosus</u>	Shatavari	It is an antioxidant & antiviral, boost the immune system, helps in ulcer treatment and supports lactation, help in Hormone balance and reduce symptoms of menopause.	
15.	<u>Wedelia calendulacea</u>	Bhringraj	It promotes hair growth & prevents hair fall and baldness, treats dandruff, scalp infection, slows down hair graying, act as liver cleanser & aids for healthy skin.	
16.	<u>Plumbago zeylanica</u>	Chitrak	It is used to treat migraine, jaundice, skin diseases, urinary calculi, seminal weakness, and internal abscesses, treat cancer, rheumatoid arthritis, and dysmenorrhea.	
17.	<u>Clerodendrum indicum</u>	Bamunhati, Chingari	It is stomachic, expectorant, anti-inflammatory, anti-bronchitis, febrifuge, useful for asthma, cough, and scrofulous affections, used to treat tumours and certain skin diseases.	
18.	<u>Curcuma aromatica</u>	Wild turmeric	It treats bruises, sprain problems, hiccough, bronchitis, cough, leucoderma and skin eruptions, domestic remedy in headache.	





19.	<u>Curcuma amada</u>	Mango ginger	It is used as an appetizer, antipyretic, aphrodisiac, diuretic, expectorant and laxative, used to cure biliousness, itching, skin diseases, treats bronchitis, asthma, hiccough and inflammation due to injuries.	
20.	<u>Boerhaavia diffusa</u>	Punarnava	It is used to cure disorders like intestinal colic, kidney disorders, cough, hemorrhoids, skin diseases, alcoholism, treats insomnia, eye diseases, asthma, jaundice, diabetes.	
21.	<u>Tribulus terrestris</u>	Gokshur	It is used in traditional medicine for chest pain, heart problems, dizziness, skin and eye disorders, expel kidney stones, a diuretic and tonic, used as a dietary supplement to improve sexual function for body building.	
22.	<u>Cymbopogon martini</u>	Lemon grass	The tea may aid in weight loss, manage diabetes and regulate blood pressure, reduces cancer risk, promotes digestion, kidney, skin, and hair health, heal a sore throat and helps combat anxiety, headaches, cough, allergies and common cold.	






23.	<u>Atropa belladonna</u>	Belladonna	It aids in treating arthritis pain, colds or hay fever, bronchospasms caused by asthma or whooping cough, treats hemorrhoids, nerve problems, Parkinson's disease, colic, treat irritable bowel syndrome and motion sickness.	
24.	<u>Chlorophytum borivillanum</u>	Safed musli	It cures physical illness, weakness, diabetes, arthritis, increase body immunity, natal and postnatal problems, rheumatism and joint pains, increase lactation in feeding mothers & act as antimicrobial, anti-inflammatory, antitumor agent, treats diarrhea etc.,.	
25.	<u>Coleus aromaticus</u>	Mexican mint	It treats malarial fever, hepatopathy, renal and vesical calculi, cures cough, chronic asthma, hiccough, bronchitis, helminthiasis, colic, convulsions, and epilepsy.	
26.	<u>Adhatoda vasica</u>	Malabar nut	It is used for bronchitis, leprosy, blood disorders, heart troubles, thirst, asthma, fever, vomiting, loss of memory, leucoderma, jaundice, tumors, mouth troubles, sore-eye, fever, and gonorrhoea.	






27.	<u>Catharanthus roseus</u>	Nithyakalyani	It is used in treating diabetes, wounds, wasp stings and muscle pain, eye infections and certain cancers. It is also used to treat fever, blood dysentery, menorrhagia and septic wounds.	
28.	<u>Nerium oleander</u>	Arali	It is used for treating heart conditions, asthma, epilepsy, cancer, painful menstrual periods, leprosy, malaria, ringworm, indigestion, skin problems and warts.	
29.	Nagamani		It is used to treat hypertension. It also cures tumor, pain, inflammatory reactions, skin diseases and malaria.	
30.	Vasambu		It is used for acid reflux, indigestion and stomach problems, protect our houses from various insects, bed bugs, cockroaches, mites, also used for cold, face, skin, dandruff, lice and hair growth.	
31.	Indian nettle		It is used as face pack for clear Skin & facial hair removal, acts as Anti-Pimple & used for heat boils, dandruff treatment, skin Rashes, eczema & hair loss problems.	

32.	Castor bean	It is used to treat abdominal disorders, arthritis, muscle aches, chronic backache, sciatica, chronic headache, constipation, expulsion of placenta, cures gallbladder pain, period pain, menstrual cramps, rheumatism and insomnia.	
33.	Gundamani	It is used to treat tetanus, prevent rabies, treat scratches, sores and wounds caused by dogs, cats and mice, leucoderma, cure fever, cough and cold.	
34.	Sanku Pushpam, Aparajita pushpam	It is used to improve memory & intelligence, cures cold cough, headaches, acts as anti-ageing & improves life longevity, improve skin quality, overall strength.	
35.	Arjuna tree	It is used in the treatment of fractures, ulcers, hypocholesterolemic, antibacterial, antimicrobial, antioxidant, antiallergic, antitumoural, antifertility and anti-HIV activities.	
36.	Lavangam pattai	It has anti-diabetic, antibacterial, antioxidant, anti-inflammatory, anticancer effects, treats gastrointestinal (GI) upset, diarrhea, gas, used for stimulating appetite, cure infections caused by bacteria and parasitic worms, menstrual cramps, common cold, and flu (influenza).	


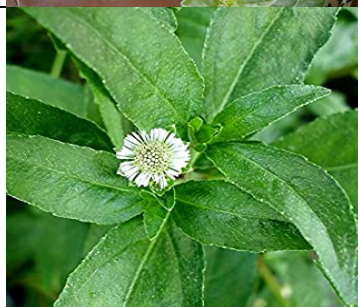



37.	Henna	It is used for stomach and intestinal ulcers, also treats dandruff, eczema, scabies, fungal infections, and wounds.	
38.	Neem	It exhibit immunomodulatory, anti-inflammatory, antihyperglycaemic, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, antimutagenic and anticarcinogenic properties.	
39.		It acts as anti-inflammatory, treats burning sensation, ulcers, and painful skin diseases, used as analgesic, cures inflammation and toothache.	
40.	Cluster fig	It treats various diseases/disorders including diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary diseases.	






41.	<u>Morinda tinctoria</u>	Noni, Manjanathi	It acts as anti-bacterial, analgesic, anti-oxidant, anti-inflammatory, astringent, laxative, sedative, and hypotensive (lowers blood pressure) potentials	 A photograph of the Morinda tinctoria plant, showing its dense, green, ovate leaves and small white flowers. A small copyright notice '© Dharanidharan' is visible in the bottom left corner of the image.
42.	<u>Melochia corchorifolia</u>	Punnakku chedi	It is used to reduce ulcers, abdominal swelling, headache and chest pain, treats snakebites, sores and the sap can be treated on wounds due to Antaris.	 A photograph of the Melochia corchorifolia plant, showing its green, serrated leaves and a cluster of small white flowers.
43.	<u>Phyllanthus amarus</u>	Carry me seed	It is astringent, stomachic, diuretic, febrifuge and antiseptic, treats gonorrhea, menorrhagia and other genital affections, used in gastropathy, diarrhoea, dysentery, intermittent fevers, ophthalmopathy, scabies, ulcers and wounds.	 A photograph of the Phyllanthus amarus plant, showing its characteristic bipinnately compound green leaves in a potted arrangement.
44.	<u>Rauwolfia tetraphylla</u>	Devil Pepper	It is used as a remedy for snake and other poisonous bite, blood pressure, diabetes, piles, malaria, wound, helminthiasis, hypertension.	 A photograph of the Rauwolfia tetraphylla plant, showing its green leaves and clusters of bright red, elongated fruits.
45.	<u>Sesbania grandiflora</u>	Scarlet wistaria tree	It is used to treat bacterial infections, inflammation, fever, febrifuge, diarrhea and cure scabies.	 A photograph of the Sesbania grandiflora plant, showing its green, bipinnately compound leaves and a cluster of purple and yellow flowers.



46.	<u>Achyranthes aspera</u>	Prickly chaff flower	It is used in treatment of cough, bronchitis, rheumatism, malarial fever, dysentery, asthma, hypertension and diabetes.	 A photograph of the Achyranthes aspera plant, showing its green, serrated leaves and a long, upright, branched inflorescence with small flowers.
48.	<u>Pandanus odoratissimus</u>	Pandan plant	It is used in the treatment of headache, rheumatism, spasm, cold, flu, epilepsy, wounds, boils, scabies, leucoderma, ulcers, cancer, smallpox, syphilis, antioxidant.	 A photograph of a Pandanus odoratissimus plant, showing its characteristic long, narrow, lanceolate leaves and a large, cylindrical, brown, textured inflorescence.
49.	<u>Jasminum auriculatum</u>	Indian jasmine	It is used for relief from some urinary, renal problems, gums & oral cavity problems, heal wounds, cure headaches, eye disorders.	 A close-up photograph of white Jasminum auriculatum flowers, showing their characteristic five-petaled structure and green buds.
50.	<u>Punica granatum</u>	Pomegranate	It prevents or treat various disease risk factors including high blood pressure, high cholesterol, oxidative stress, hyperglycemia, inflammatory activities.	 A photograph of a Punica granatum (pomegranate) tree, showing several bright red, ripe fruits hanging from the branches among green leaves.
51.	<u>Solanum indicum</u>	Egg plant	It treats asthma, catarrh, dropsy, chest pain, chronic fever, colic, dry & spasmodic cough, oedema, scorpion stings, difficult urination and worm infestation.	 A photograph of a Solanum indicum (eggplant) plant, showing a single, dark purple, elongated fruit hanging from the stem among green leaves.

52.	<u>Cynodon dactylon</u>	Bermuda grass/ Devil's grass	It is used to treat anasarca, cancer, cough, cramps, convulsions, dysentery, headache, hypertension, measles, rubella, snakebite, tumors, warts and wounds.	 shutterstock
53.	<u>Cedrus deodara</u>	Deodar cedar	It treats fever, inflammation, pain, ulcer, apoptosis, spasmodic, hyperglycemia, infections, insomnia, disorder of mind, skin & blood related diseases.	
54.	<u>Datura innoxia</u>	Angel's trumpet	It is used for alleviating pain, treating fever, enhancing heart functions, improving fertility, inducing sleep, easing childbirth, promoting hair & skin health.	
55.	<u>Ficus religiosa</u>	Pepal	It is used as anti ulcer, anti bacterial, anti diabetic, treats cough, asthma, toothache, ear pain, gastric problems, migraine and skin diseases.	
56.	<u>Gymnema sylvestre</u>	Gurmar	It treats diabetes, metabolic syndrome, weight loss and cough, act as snake bite antidote, digestive stimulant, laxative, appetite suppressant and diuretic.	

65.	<u>Acacia Senegal</u>	Gum Arabic tree	It treats throat and stomach inflammation, minor wounds and scrapes, HIV, hepatitis C virus and cancer, acts as anti microbial, anti plasmodial, anti oxidant.	
66.	<u>Senegalia catechu</u>	Cutch tree	It treats sore throats and diarrhea, high blood pressure, dysentery, colitis, gastric problems, bronchial asthma, cough, leucorrhoea and leprosy.	
67.	<u>Abrus precatorius</u>	Rosary pea	It cures cough, asthma, bronchitis, tuberculosis and chest pain, gonorrhoea, jaundice and hemoglobinuria bile.	
69.	<u>Acorus calamus</u>	Sweet flag	It treats neurological, gastro intestinal, respiratory, metabolic, kidney, stomach, skin, ear, liver disorders.	
70.	<u>Ziziphus mauritiana</u>	Indian plum	It is used as anticancer, anti-inflammatory, anti-plasmodial, anti-microbial, sedative, analgesic, treats liver damage, diabetes, coughs, headache, boils & dysentery.	

57.	<u>Origanum vulgare</u>	Oregano	It is used to treat asthma, bronchitis, cough, diarrhea, indigestion, stomachache, menstrual disorders, diabetes, used as anti- bacterial, anti-inflammatory.	
58.	<u>Eclipta prostrata</u>	Gunta kalagaraku	It treats skin problems, hepatic problems, jaundice, gastrointestinal problems, respiratory problems, respiratory problems, fever, hair problems, wounds.	
59.	<u>Jasminum sambac</u>	Arabian jasmine/ Mogra	It is used to treat cardiovascular problems, used in suppressing lactation, soothing headaches, stimulating brain, restoring balance, acts as antiseptic anti-inflammatory, analgesic.	
60.	<u>Evolvulus alsinoides</u>	Morning- glory	It treats neurodegenerative diseases as brain tonic, amnesia, asthma, epilepsy, nootropic, psychotropic effects and act as hepatoprotective.	
61.	<u>Prosopis cineraria</u>	Jammi	It treats gastrointestinal, respiratory, cardiovascular disorders, used as anti- cancer, anti-diabetic, anti-inflammatory and anti-microbial purposes.	

62.	<u>Aegle marmelos</u>	Bilwa/ Bael	It acts as anti diarrhoeal, anti microbial, anti viral, anti cancer, anti pyretic, anti inflammatory, ulcer healing, anti fertility, treats constipation, diarrhea and diabetes.	
63.	<u>Rauvolfia serpentina</u>	Sarpagandha/ Indian snakeroot	It helps to improve blood sugar levels & have anti-bacterial properties, anti-diarrheal properties, sedative properties and helps improve digestion.	
64.	<u>Tinospora cordifolia</u>	Heart – leaved moonseed	It treats fever, jaundice, chronic diarrhea, cancer, dysentery, bone fracture, pain, asthma, skin disease, poisonous insect, snake bite, eye disorders.	
65.	<u>Centella asiatica</u>	Saraswathi leaf	It heals wounds, improve mental health, treats skin conditions such as leprosy and psoriasis.	
66.	<u>Abelmoschus esculentus</u>	Lady's finger	It is a source of anti oxidant, used in plasma replacement or blood volume expanders, reduce the risk of cancer, diabetes, stroke, heart diseases.	

69.	<i>Aconitum heterophyllum</i>	Ativisha	It treats diarrhea, fever with chills, cough, dyspnea, vomiting, maintains healthy digestive system.	
65.	<i>Allium sativum</i>	Garlic	It boosts body immune system, treats high blood pressure, cardiovascular problems, diabetes, cholesterol, prevents cancer, alzheimer's and dementia, act as an anti oxidant.	
66.	<i>Withania somnifera</i>	Ashwagandha	It enhances the function of the reproductive system, brain and nervous system and improves the memory, lowers blood pressure, regulates blood sugar levels, improves cardiac health, reduce stress and inflammation.	