MUSHROOM TODAY

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আজকের মাশরুম

SANGRI-LA

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Nutritional Information	
Protein :	2.50%
Fat :	0.36%
Carbohydrate :	6.30%
Calories :	33.50%
Fiber :	1.10%
Ash :	1.00%
Moisture :	89.50%
Thiamine :	0.1 mg.
Riboflavin :	0.5 mg.
Niacin :	10.9 mg.
Ca :	3.3 mg.
P :	134.8 mg.
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Contents

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বিশ্বাস মাশরুম ফার্ম

ফোনে যোগাযোগ করুন ঃ 03472-231803

6 to 10 A.M. - 4 to 11 P.M.

বীজ — Oyster Mushroom

(ঝিনুক মাশরুম)

বীজ — Milkywhite Mushroom

(Calocybe indica)

বীজ — Paddy Straw Mushroom

(পোয়াল ছাতু)

১৫ বৎসরের অভিজ্ঞতা

➢ প্রচুর পরিমানে **Dry** ও **Fresh Mushroom** পাওয়া যায়।

➢ প্রচুর পরিমানে উন্নতমানের বীজ সরবরাহ করা হয়।

➢ সারা বৎসর মাশরুম চাষের উন্নত পদ্ধতিতে প্রশিক্ষণ দেওয়া হয়।

Editorial

Mushroom cultivation is one of the most modern and advanced branches of the agricultural industry. Still today, the Government has failed to set up specific policy regarding its status. It is yet to be acertained, whether the 'Mushroom Industry' is under the Divectorate of Industry, Agriculture, Horticulture or Food Processing. There by, there is always a confusion and beneficiaries in dilemma.

Organised farming of mushroom is a new industry in India and there is vast potential for development of mushroom cultivation.

Mushroom have been popular, apart of dietary habits, for their flavour and higher food value since ages. Their protein content is highly digestable and may be considered intermediate to that of animals and vegetables and as excellent source of vitamins and minerals.

During the recent years emphasis is given on propagation of mushroom cultivation. The agricultural wastes like wheat and paddy straw are available in abundance as the basic raw material for growing mushrooms.

The demand of mushrooms is increasing very fast in our country as well as there is export potentility of the item, thereby the Government is requested to immediately set up a status as well as determine the policy for the establishment of this profitable industry in our state and country.

সম্পাদকীয়

কৃষি শিল্পের অন্যতম আধুনিক প্রয়োগ হল মাশরুম উৎপাদন, কিন্তু এখনও মাশরুম সরকারী কোন দপ্তরের অধীন —— শিল্প, কৃষি, উদ্যান বিভাগ না খাদ্য প্রক্রিয়াকরণ তা স্থির হয়নি, তার ফলে মাশরুম সংক্রান্ত কোনও নীতি আজ অবধি সরকার গড়ে তুলতে পারেনি। ফলশ্রুতিতে আমাদের দেশে এখনও মাশরুম, শিল্প হিসাবে গড়ে ওঠে নি।

সংগঠিত মাশরুম উৎপাদন আমাদের দেশে একটি সম্ভাবনাময় শিল্প এবং এর অসীম বিকাশ সম্ভব।

মাশরুম তার পুষ্টি মূল্য ছাড়াও, আস্বাদ, গন্ধ ও খাদ্যাভাসের জন্য সময়কাল ধরে জনপ্রিয় সবজী। মাশরুমের প্রোটিন সহজপাচ্য এবং এর গুণগত মান প্রাণিজ ও নিরামিষ প্রোটিনের মধ্যবর্তী প্রকারের, এবং এটি ভিটামিন ও খনিজ লবণের চমৎকার উৎস।

বর্তমানে, মাশরুম উৎপাদনের জন্য বিশেষ উৎসাহ প্রদান করা হচ্ছে। কৃষিজ বর্জ, যথা গম অথবা ধানের খড় গ্রামাঞ্চলে প্রচুর পরিমানে পাওয়া যায়। এই বর্জ স্বল্প পরিশ্রম এবং অল্প খরচে, মাশরুম উৎপাদনে ব্যবহার করা যায়। এবং এর থেকে একটি মূল্যবান খাদ্যমূল্য যুক্ত অর্থকরী ফসল তৈরী করা যায়।

আমাদের দেশে, মাশরুমের জনপ্রিয়তা এবং প্রয়োজন দ্রুত বৃদ্ধি পাচ্ছে। এছাড়াও আন্তর্জাতিক বাজারে মাশরুমের চাহিদা রয়েছে। সরকারের কাছে আমাদের তরফ থেকে নিবেদন করা হচ্ছে, এই মুহূর্তেই মাশরুম সংক্রান্ত সঠিক নীতি নির্ধারণ করা, যাতে এই শিল্পকে লাভজনক অর্থকরী ব্যবসা হিসাবে স্থাপন করা যায়।

Information for Doctors

MUSHROOM THE WONDER VEGETABLE

Nutritional Value of Dehydrated Oyster Mushrooms.

Protiens	:	40 %
Minerals	:	10 %
Crude Fibre	:	35 %
Water	:	10 %
Carbohydrates	:	5 %
Vitamin	:	Rich

Mushroom is a 100% Vegetable Delicacy

Health Benefits.

- Mushrooms are safe and Healthy for Obese persons, Heart patients & Diabetics.
- Mushroom prevents Hyper Acidity and Constipation, due to high Fibre content.
- Mushrooms are found to posses anti-tumor activity.
- Mushrooms are found to enhance and also stimulate the human immune system.
- Mushrooms are found to contain anti-viral and anti-cancer properties.
- Mushrooms are known to increase memory power and aid the digestive system.

Some Medicinal Facts.

- Mushrooms contain 83% of fatty acids in the form of Linoleic, essential for Human.
- Studies indicate mushroom serves better than Ferric Ammonium Citrate in restoring Hemoglobin of blood.
- Mushroom proteins are at par with egg protein in terms of essential amino acids.

Daily intake of 100 gms. of Oyster Mushroom satisfies norms set by FAO / WHO: —

1. 24-43% of the Daily Requirement of

Ascorbic acid (Vitamin C) for an Adult.

2. 10-15% of the Daily Requirement of Thiamine (Vitamin B1) for an Adult.

3. 26-33% of the Daily Requirement of Riboflavin (Vitamin B2) for an Adult.

4. 53-60% of the Daily Requirement of Folic acid for an Adult.

Mushrooms offer a high value nutrition rich food, - Mushroom should form a part of the daily diet of health conscious people.

Mushroom is a simple form of life known as Fungus. It lacks chlorophyll & cannot therefore make it's own food. It grows on dead organic matter with other living organisms. In other words, it converts agricultural organic wastes such as leaves, straw, paper etc. into edible vegetable Protein, Vitamins & Mineral rich food. Oyster Mushroom (*Pleurotus sps*) is an Asian variety mushroom and is called so for it's Oyster like shape. It is rich in Proteins, B-Complex Vitamins, Minerals (Iron, Calcium, Potassium & Phosphorus) and Crude Fibre.

Mushrooms are low in calories, have no Cholesterol, and are virtually free of Fat and Sodium.

In short, mushrooms are high value vegetarian food with no side effects.

An Ideal Food for Weight and Diet conscious People.

Mushroom - Food of the Gods

Ancient Koreans considered mushrooms "the food of the earth" or "the incarnation of the fairy." while the ancient Greeks and Romans said it was a "food of the gods."

The Chinese, who have a long history, treated it with great care, for they thought of it as the elixir of life. The Korean botanical list called "Bonchogangmok" classifies mushrooms as "Kyun"(fungi) for those that grow on hard surfaces and "Ji" for those that grow on soft surfaces.

Mushrooms were first brought to Korea during the era of the "Three Kingdoms." There are records proving that the Kum-ji was offered on the first month as a tribute in Woong Chun Joo (presently referred to as Kong Joo), as well as the Su-Ji in Sa Bul Joo (presently referred to as Sang Joo).

Also, historical evidence that fungi on wood and on the ground were used during the period of King Sungduk can be found . By looking at the other chronicle, Sejong Sillok, we can see that pine-mushrooms, oak-mushrooms, and some other mushrooms were used as food during the period of King Sejong, the fourth king of the Chosun dynasity. The record that Wolfiporia cocos was used for medicinal purposes proves that the mushroom has been used for a long time.

In ancient records regarding the mushroom, Choi Woo says "the mushroom expunges toxic heat, enlivens the body, and cools the body temperature. The mushrooms grown

in winter that are soft and white are non-toxic ,and if you take them for an extended period of time, they strengthen the stomach and the intestines." In Yang-Sang-Yo-jib, the mushroom is referred to as a "sweet, warm-natured food that lightens the body movement and improves the function of the 9 Kung (angular measure of 30 degrees)." As can be seen in the ancient records above, people ate wild mushrooms in the mountains and fields as a delicacy and considered them as a rare health-enhancing ingredient. Consuming mushrooms were important to our ancestors.

News

(1) The Hindu, August 27

Mushrooms and cure

Exotic fungi such as shitake and oyster mushrooms could provide a powerful new weapon in the fight against cancer, according to an analysis of research in the Far East. The Health Charity Cancer Research, U.K. has reviewed how fungi are used to treat and prevent cancers in ancient and modern eastern medicine. The report says pure extracts of exotic mushrooms such as shitake, enoke maitake and oyster have been shown by researchers in China, Japan and Korea to have anti-tumour properties and to be capable of stimulating the immune system to fight disease. It also reproduces research findings from the Far East that suggest medicinal mushrooms can help reduce side-effects from radiotherapy and chemotherapy and improve the quality of life for patents in the advanced stages of cancer. Prof. John Smith from the University of Strathclyde, who led the review, said there was increasing evidence that some mushrooms offered medicinally important compounds that had yet to be evaluated in the West. The active compounds in exotic mushrooms are complex sugars called polysaccharides, which are said to enhance the activity of the immune system.

(2) THE TRIBUNE

Monday, October 21, 2002,
Chandigarh, India

Let non-winter varieties also mushroom

Haryana should exploit Delhi neighbourhood advantage

B. S. Dahiya and Surjeet Singh

AMONG the food sources for humans also come microbes, of which fungi comprise the largest and most important group containing edible species of mushroom. Although mushrooms, which appear in nature, are delicious and nutritious, not all are edible and a few are even poisonous.

Breakthrough

Dheeraj Bhaik

SCIENTISTS of the National Research Centre for Mushroom, Solan, have achieved a major breakthrough by successfully growing Reishi *(Ganoderma lucidum)*, an important medicinal mushroom that grows in the wild.

Let non-winter varieties also mushroom. Haryana should exploit Delhi neighbourhood advantage.

B.S. Dahiya and Surjeet Singh

AMONG the food sources for humans also come microbes, of which fungi comprise the largest and most important group containing edible species of mushroom. Although mushrooms, which appear in nature, are delicious and nutritious, not all are edible and a few are even poisonous.

Mushrooms have traditionally been used in India as garnishing on food and a few varieties

have also been treated as tonic or medicinal material. Sincere efforts to bring mushrooms under cultivation were made in 1961 after the commissioning of a scheme, "Development of mushroom cultivation in Himachal Pradesh," at Solan. Initially it was thought that *Agaricus bisporus* (white button mushroom) being a temperate mushroom could be grown only in the hills under seasonal conditions during winter. But now it has been scientifically proved that seasonal cultivation of this European mushroom is also successful in North-Indian plains.

From left: Summer white button mushroom, paddy straw mushroom, oyster mushroom and milky mushroom.

Though Haryana was a late starter in mushroom cultivation, yet in the past decade it has achieved tremendous increase in mushroom production. Mushroom growers of the state, apart from generating employment, earned Rs. 7 crore as additional income from this crop alone during 1997-98. At the CCS Agricultural University, Hisar, standardisation of the cultivation technology suited to local conditions for locally consumable mushrooms has been done. These are *Agaricus bisporus, A. bitorqis, Pleurotus,* spp., and *Volvoriella volvacea* (paddy straw mushroom). Though the production technologies for these have been developed, yet all these mushrooms could not achieve commercial status, except the white button mushroom (*A. bisporus*). Now, growers are also showing interest in oyster mushroom cultivation and in the coming years it is likely become a commercial venture. Since all mushrooms are grown indoor, thatched

structures made of locally available material like stalk of sarkanda, jowar, bajra, cotton sticks, dhaincha, etc., have been found superior to brick structures under low-cost technology. These structures are cheap and provide natural ventilation, which is required in mushroom houses.

Regarding marketing of fresh mushrooms, growers of Haryana do not face any difficulty, being in the vicinity of Delhi, which is a major market for fresh mushrooms. Out of India's estimated production of 50,000 tonnes, Haryana alone produces more than 5000 tonnes annually. However, even this quantity is not sufficient, considering the growing popularity of mushroom among consumers due to its flavour, nutritive and medicinal attributes. Farmers like to cultivate mushrooms because this venture is less land dependent as it is grown indoors using vertical space. It also escapes natural vagaries like rain, hailstorms, etc. Environmentalists prefer it because of its eco-friendly nature as mushrooms use agricultural waste/byproducts as their food and convert them into protein-rich food. The spent compost substrate—the compost left after taking the crop—can be used as organic manure or as casing material.

Alternative varieties

Unfortunately, till today only *A. bisporus* is 'in vogue' in Haryana. This being a temperate mushroom can be cultivated only during winters in Haryana. For most part of the year, the temperature is not suitable for white button mushroom. Keeping this in mind, efforts have been made to popularise *A. bitorquis*, a high-

temperature white button mushroom that can tolerate slightly higher temperatures (24-25° C) as compared to *A. bisporus,* which requires relatively lower temperatures (14-18° C) for production. But the temperature range of 24-25° is most congenial for pests and diseases, which create hurdles in its successful production using low-cost cultivation technology. So growers should cultivate oyster mushroom, paddy straw mushroom or white milky mushroom for which the market is likely to develop in near future.

As the mushroom spawn (seed) is a crucial component in mushroom cultivation, and in Haryana mushroom growers require approximately 100 tonnes of spawn annually, this is also a major opportunity for agricultural science graduates who can put up spawn laboratories so that the growers get good quality spawn.

Constraints

1. A major difficulty faced by mushroom growers is depressing/low market rates due to heavy production during the peak season and dumping of produce by a few export-oriented units in the local market. There is no system at present by which growers can be protected from the crash of prices.
2. Availability of quality spawn
3. Low and variable productivity
4. Low consumption in domestic market, especially in rural areas the consumption is extremely low.
5. Weak financial status of entrepreneurs/ growers and limited institutional financing.
6. Post-harvest losses in quality.
7. Lack of industries involved in post-

harvest processing/marketing value-added products.

Future outlook

1. Mushroom production can reach any height if assured procurement prices are there. For this formation of mushroom growers' cooperatives can go a long way.

2. Mushrooms being a highly perishable commodity, the establishment of processing industries is needed.

3. To compete in the international market, emphasis on quality produce is required and indiscriminate use of pesticides/chemicals during cultivation should be curbed.

4. Quality spawn production is another area that needs proper attention so that mushroom growers do not suffer on account of sub-standard spawn. There should be proper labelling of spawn bags indicating the name of mushroom, strain, weight, expiry date, etc. At present there is no regulating authority in India to monitor the quality of spawn.

5. Alternative varieties like oyster, paddy, paddy straw and white milky mushrooms should be encouraged by educating growers and consumers about its vast production potential and nutritional value.

6. Domestic market should be catered to by seasonal growers while the export-oriented units should confine to exports.

Breakthrough

Dheeraj Bhaik Medicinal mushroom Reishi

SCIENTISTS of the National Research Centre for Mushroom, Solan, have achieved a

major breakthrough by successfully growing Reishi (*Ganoderma lucidum*), an important medicinal mushroom that grows in the wild.

Known as Ling Zhi in China, the mushroom has wide-ranging uses in the pharmaceutical industry because of its efficacy in treating diseases like cancer, diabetes and hypertension.

According to Dr R. D. Rai, Principal investigator of the project on medicinal mushrooms, the technology of Reishi production had been till now a monopoly of a few countries like Japan and China, which kept it a closely guarded secret. Mushrooms have a world trade of about $4 billion and till now it has been dominated by China, Japan and Korea.

Out of the total global production of about 6000 tonnes, China alone contributes over 4000 tonnes. The USA is the biggest market for medicinal mushrooms and their products. Medicinal products of Reishi in the form of capsules and tablets are being sold as dietary supplements.

Referring to the technology developed by the centre, Dr Rai says in the absence of any scientific literature on the cultivation of Reishi his team had to pick up clues from the Internet and try a number of permutations and combinations of various types of sawdust, supplements, nutrients and environmental conditions. The success was achieved after work spanning over five years. Most importantly, the famous Red Reishi was grown organically to full maturity.

The growth medium is steam sterilised, which can be done in an autoclave and the

temperature required is 28-30 C with 85-90 per cent relative humidity. One crop takes about five months. Dr S.R. Sharma, Director of the institute, said the breakthrough could be regarded as one of the "greatest achievements of the centre" in the field of medicinal mushrooms. Complete details of the technology could not be disclosed because the centre would file for a patent for the "benefit of the country."

He expressed confidence that with the establishment of a modern growing facility the centre would be able to come out with production technology for many new varieties and develop state-of-the-art technology for farmers.

In the Chinese system of medicine mushroom is regarded as a symbol of longevity or immortality. Reishi is reported to contain a treasure of pharmacological triterpanes, adenosine derivatives, organic germanium and a very active protein called Ling Zhi-8, which exhibits a wide range of medicinal benefits.

It has been found to be effective against diseases like cancer, cardiac arrest, diabetes and hypertension, besides its immuno-stimulating properties.

(3) THE TIMES OF INDIA

CITIES : AHMEDABAD

TIMES NEWS NETWORK[THURSDAY, AUGUST 28, 2003 11:57:23 PM]

MSU professor develops medicinal mushroom

VADODARA : For most people mushrooms are what you sprinkle over your pizza. But imagine a mushroom with medicinal values that helps tumours to regress and restricts the progress of

the HIV virus.

The Shiitake mushroom is the species from which such medicinal values have been extracted and until now, it was only available outside India, mostly in Japan and China. Not surprisingly, it is the costliest mushroom in the world. However, MS University's Dr Arun Arya has become the first man in India to cultivate Shiitake in controlled conditions at the university's laboratory.

Arya's achievement can be gauged from the fact that India has commercially cultivated only 12 species of mushrooms until now. He is hoping that his research will spur commercial markets to cultivate other species of mushrooms as well. A professor with the botany department, Arya cultivated Shiitake using the synthetic log technique in 170 days. The XII World Forestry Congress to be held at Canada has asked him to present his reserach.

"Researchers in China and Japan have proved extracts of Shiitake to be effective against viruses that cause Hepatitis B, the deadly AIDS and cancerous cells," said Arya. According to research at Tokyo's National Cancer Center Research Institute in 1969, a polysaccharide compound taken from Shiitake that they named as Lentinan caused tumours in laboratory mice to regress or disappear in 80 to 100 per cent of the subjects. Further studies by Wasser and Weis of the US in 1999 have also proved the medicinal values of Shiitake against these diseases.

Another research by Hobbs in 1995 from a composition prepared from the mycelium of Shiitake suggests that the composition is more effective in restricting the progress of HIV virus

in cells than the famous drug AZT. "People think mushrooms are poisonous. But of the nearly 10,000 species only about 10 per cent are poisonous. The rest are edible and very nutritious containing large amounts of protein, fibre, minerals (including calcium), B vitamins and vitamin C," said Arya. The synthetic log technique or the plastic bag technique of Arya's method in cultivating Shiitake is simple and cost-effective. Shiitake can be cultivated by inculcating *Lentinus edodes*, a white rod wood decay fungus, into saw dust of hard wood trees like Teak *(Tectona Grandis)*, Jungli Badam *(Acacia arabica)* or Babul *(Terminalia catappa)*, said Arya.

"After procuring *Lentinus edodes* from the National Centre for Mushroom Research and Training (NCMRT), Solan, it was inculcated by adding sawdust, pearl millet grams and yeast and was supplemented with potato dextrose agar to maintain the stock culture. This was then kept in polythene bag for 150 days. Then to reduce the content of carbon-dioxide, the product was kept under 15 degree centigrade with 80 per cent humidity for another 20 days," said Arya.

The first crop was Shiitake obtained after 170 days, added Arya. Earlier, cultivation of Shiitake by natural means took anywhere between six months to two years. Synthetic log technique can effectively reduce this timeframe and can be grown throughout the year. Other than that, if Shiitake can be cultivated artificially the cost of production as well as the market price will go down. We have estimated the cost of production of Shiitake at Rs. 50-60 per kilogram and will be available in the market at Rs. 400-500 per kilogram, added Arya.

SCIENTIFIC PROCESSING OF MUSHROOMS FOR CONSUMER MARKETING

- Dr. Rita Ganguly

Co-ordinator :
The W.B. Edible Mushroom Cultivators & Mushroom Spawn Makers Association.

The use of mushrooms as a food in our daily diet, have already being accepted by the common people. This acceptability will increase day by day and that will create a huge demand of mushroom (both in fresh form and processed form) in the market. Mushrooms are highly perishable in nature and get spoilt readily unless special preservative methods are used. So they require a great deal of attention starting from cultivation to cropping (picking up of mushroom fruit body at optimum stage), processing at the post harvest stage, its storage and marketing also. Discolouration, weight loss, off flavors development are some common problems of mushroom at the post harvest stage.

Preservation and processing of mushroom involves various ways like other common perishable foods are stored and preserved. The science behind the preservation techniques are to minimize the contact between micro-organisms and the foods, to eliminate microorganisms or at least adjust conditions of storage to prevent their growth. The main factors of a food item that influence

microbial activity (food spoilage) are its hydrogen-ion concentration i.e. pH factor, moisture content, oxidation - reduction (O-R) potential, nutrients and the presence of inhibitory substances or barriers. If the microorganisms involved in food are pathogenic, their association with our food supply is critical from a public health point of view. So it is important to prevent their entry and growth through the suitable processing techniques.

(A) Cropping, harvesting and storage of mushroom in fresh condition :

Like other fresh vegetables mushrooms are also favoured by the customer in fresh condition. Selling of fresh mushroom is also very profitable to the grower. But in case of fresh mushroom marketing, an important question is when mushrooms should be, picked for longer storage and good market acceptance. A mushroom grower should be aware of the term "market maturity" i.e. the fruit body will be as compact as possible. Mushroom should be picked up at a relatively young state, i.e. when the cap is still tight over a short stem, before the breaking of the veil. Long stems and dispersing spores from the gills are less desirable for mushroom marketing. Spores simply float away in the air and a large percentage of the weight goes with them. Mushrooms become fragile and loose their freshness during marketing. Fresh mushrooms which were picked more than a day before they reached their biological maturity will last about one week in a p.p. bag at 4^0 in a moist refrigerator. Although there are various methods of preservation like vacuum cooling,

low temperature storage, controlled and modified atmosphere storage, gamma radiation, freeze drying etc., for increasing shelf life of fresh mushroom, but there remains much to be practiced about the best and cheapest commercial method of handling of freshly harvested mushrooms and how they might be better handled for long time marketing. The quality regulation instructions for better post--harvest handling of fresh mushrooms are,

(i) harvesting at appropriate maturity, optimum size and shape.

(ii) Restricted use of spraying of water to the fruit body (a little only at the pin-head stage).

(iii) Proper cleaning and grading.

(iv) Protection from sunlight.

(v) Precooking and transportation at desirable temperature in poly bag and packing in card board boxes with proper ventilation.

(B) Preservation and other processing of mushroom for long term storage :

(i) Dehydration of mushroom :

For long term storage the oldest and cheapest method of preservation is dryinq i.e. drying by the Sun's rays. After proper cleaning and grading mushrooms (mainly oyster) are exposed to the Sun rays which is reduced to nearly one-tenth of their weight. Acceptable dried mushroom will rehydrate when it is boiled in water. The rehydrated product will have a firmer texture than fresh mushroom. Sun drying is limited to climates with a hot sun and a dry atmosphere.

Mushrooms can also be dried in a mechanical dehydrator i.e. of artificial drying

which involves treating them at 50°-60°c with controlled relative humidity over the material to be dried. Dried mushroom should be stored in air tight containers in a cool, dark, and dry place, to retain their original colour and flavour during storage. There is a great demand for quality dry Oyster mushroom inland as well as in export market. Demand in local market is also rising, so mushroom growers should be cautious about their production of quality dry product. Apart from that, dry mushroom power are used to prepare varieties of testy food-products like Nimki, Vujia, Papri, Bari, Chow, Papad, Soup Powder etc. Which also have a good market.

(ii) Preservation by Pickling :

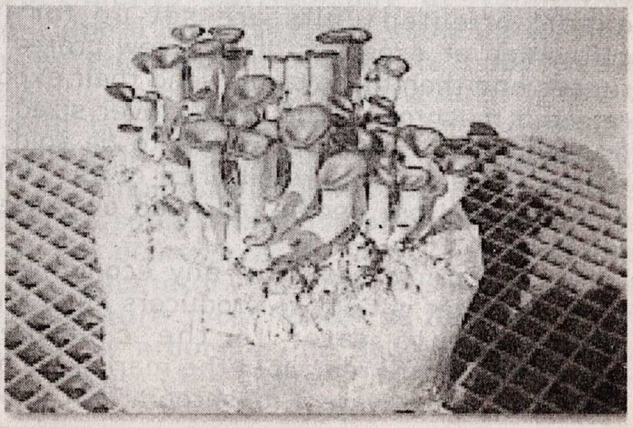
Pickling is also very old method of preservation of food products. A good recipe makes mushroom to a tasty pickles. Relatively high concentration of food acid and salt as well as oil in pickle will tend to keep the texture of mushroom better than a fresh mushroom. Sour and sweet-sour types of pickles of mushroom are popular in the market. Mushrooms are also preserved in the forms or jam (mushroom-apple), jelly (mushroom-pineapple), sauces (mushroom-tomato/Chille)& ketchup etc.

(iii) Canning of mushroom :

Canning is defined as the preservation of foods in sealed containers and usually implies heat treatment in the prevention of spoilage. Only button mushrooms are canned presently for long-term storage and marketing. Brine solution consisting of common salt, sugar and citric acid are used for preservation of mushroom in can. Cans are usually made of tin-coated steel

or in glass containers, or partially or wholly of aluminum, flexible plastic or plastic laminated with foil pouches. Oyster mushroom is one of the poorest genera for canning in brine, because the caps are thin and as they are cooked in the brine, they loose their texture and become quite unpleasant in appearance and taste. For Oyster mushroom drying is the best method of preservation.

Now, it is a high-time for mushroom marketing when attempt should be made of its regular availability in an acceptable form to the consumers. The mushroom growers must be cautious about the quality of their food products before presenting them to the commercial market with proper preservation, processing and packa-eging also considering the present health-cautious consumers both in inland and international arena-failing of which they may not only face financial loss, but also create an anti-mushroom apathy in the consumers, and thereby possible problems will arise for the mushroom industry of our state.



RECENT ADVANCES IN THE CULTIVATION TECHNIQUES OF *Calocybe indica* (MILKY MUSHROOM)

Tushar N. Mehta

Whenever an oyster mushroom cultivator goes to a market to sell his product he faces same reply that a cultivator going to a hotel or restaurant gets – everywhere the demand is for button *(Agaricus spp)* mushroom and oyster mushrooms are given second grade respect. The button mushroom has captured the psyche of the people to such an extent that for common people mushroom means – white umbrella shaped structure only.

We know very well that cultivation of button mushrooms is not only very capital intensive but technically complex too. So big export oriented units are set up for its cultivation at expenses of over few crores of rupees and then these farms send their export rejected mushrooms (i.e. either over sized or bruised or with their veil open) to be sold at the local market at a retail price of Rs. 100/- or more, and our people fall head over heels for them.

The prime advice of any economist is that Customer is God, so producers have little choice but to cater to the customers fascination. So to remain in the market we are supposed to cultivate a mushroom that looks

like a white umbrella. Is there a cheaper choice for us? Yes!

A mushroom that falls in this category which is white umbrella shaped, cheap and technically easy to cultivate is *Calocybe indica* Or milky mushroom. This mushroom has two very big advantages over button mushroom firstly it has very good shelf life which is over one week while button has a shelf life of only three days, secondly button mushroom gets pigmented i.e. turns brown at places where it is bruised or damaged, but *Calocybe indica* does not change its colour and remains white even after getting bruised. But *Calocybe* has a bery big disadvantage in comparison to button which is its giant size. A fruitbody fool a customer by placing a 15 times larger mushroom than a button mushroom and still make him purchase it? No you cannot do it. It is easier to fool a customer into purchasing a *Calocybe* in place of *Agaricus* only if the size difference is nearly $1^1/_2$ to 2 times instead of 10 to 15 times.

I am here giving the results of several experiments carried out at Tamilnadu Agricultural University with many inputs from my experiences that will be able to reduce the size of *Calocybe indica* within a range where it would be able to compete with *Agaricus bisporus* on shop shelves for buyer attention.

Although you all know but still I will like to repeat some of the basic physical parameters that are of importance. *Calocybe indica* is a high temperature tropical mushroom so the tempereture most ideal for its cultivation should be around 30-35 degrees Centigrade. This variety likes ample light of around 2000

lux intensity during case run and fruiting period it also likes humidity of around 85% - 90% all throughout for better growth.

The cultivation prodecure is very much like oyster mushrooms as far as quality of straw, size of chopped pieces of straw and soaking period and drain period are concerned. The straw is best steam sterilised as *Calocybe* does not quite like chemicals, and it has even been noticed that with chemical sterilisation it is not quite possible to stop the incidence of weed fungus *Coprinus comatus* attacking the bags. Steam sterilisation is thus preferred over chemical sterilisation.

After the compost is ready for spawning it is spawned by layer method in polybags just like oyster mushrooms but here the amount of straw taken per 200 gm. Spawn is 1.5 kg. (dry weight) instead of 2 kg. (dry weight). The spawned bags are perforated at several points with a thin nail so that the performations are not more that 1mm. in diameter for aeration. These bags are incubated for 10 days in a room where there is diffused light. After about 15 days when the substrate is almost covered with mycelia it is transferred to a well aerated and lighted room. Actually one critical point to keep in mind is that there should be light of 1600 to 2000 lux intensity and that too of BLUE colour. This blue colour can be achieved by covering the cropping room roof with a blue coloured plastic thus the sunlight is filtered to give only Blue coloured light of the required intensity. After about 15 days of incubation the bags are completely covered with mycelia. After this the bags are cut into two equal halves with the

help of a hacksaw by cutting right through the middle horizontally. The two cut halves/ surfaces are then covered with 2cm. of casing soil. This casing soil is prepared with garden soil and coarse sand in equal proportion with calcium carbonate added to achieve a pH of 8, and then either steam sterilised at 80°C for $1^{1}/_{2}$ hours or with addition of Formalin at the rate of 50 ml per kg. Of casing soil soil and then covering it for 48 with a plastic and then drying it till all the smell of Formalin is evacuated. The pH can either be measured with pH meter or less expensively with the help of pH paper.

Normally the case run period is 10 days if the temperature is around 32°C and humidity is around 90%. As soon as the pinheads appear after 10 days the aeration of the cropping room is increased with frequent air changes but keeping the humidity to 85% and 1600-2000 lux blue light. Under these conditions many pinheads grow up simultaneously. We would see that instead of getting one or two giant sized mushrooms we get 12 to 15 smaller sized mushrooms which very much look like oversized button mushrooms that are sold in the market by button mushroom producers since they are rejected in the export market.

After the first harvest the casing soil is slightly ruffled and once again loosely compacted and then moistened. The next flush comes in a week to ten days time and then similarly third flush is taken. Commercially three crops are taken and it might be completed within 60 days. The biological efficiency is comparable to oyster mushrooms *Calocybe* is sold at Rs. 60-80 per kg. would be able to

replace Button which costs atleast Rs. 100 per kg.

Until now I have just mentioned a method but given no reasons for it. And any respectable, intelligent grower would certainly like to know the reasons behind this. Along with this I would like to invite those with a scientific inclination to use and extrapolate these findings and reasonings for the betterment of other commercial crops too and then spread them for the general public for use.

(1) It was found that frequency (hence colour) of light has a strong influence upon the number of pin heads growing up. As the frequency increased i.e. colour changed from Red to Yellow to Green to Blue the number of pinheads growing up simultaneously also increased, so blue light is advocated to be used. Obviously as the number of fruitbodies increase their individual size and weight is bound to decrease.

(2) It was also observed that intensity of light also influenced the shape and size of the mushrooms. With low intensity diffused light the stipe was longer with a small pileus and as the intensity increased the stipe length decreased and the pileus diameter increased. As we all know that the stipe of *Calocybe* is much more fibrous compared to pileus hence customer satisfaction is also achieved with larger pileus then tripe intensity of light was found to be 1600 lux at the casing run and 2000 lux at fruiting stage. Though with reduced temperature like in northern India where temperature are below 30°C the light intensity can be increased upto 2800 lux to get better

results.

(3) The best temperature at case run is around 32°C and at fruiting it is 30°C. But fruiting is very hard to get below 25°C.

(4) As the colonised bags are cut horizontally into two equal halves there is a combined effect on the size and number of fruit bodies – Firstly two halves means double surface area for fruiting and similarly two halves means half double surface area for fruiting and similarly two halves means half compost depth. Both these together has thus a four fold effect i.e. the size is 1/4th of normal size.

If all these factors are strictly followed and also as need arises modified according to local needs we are surely to get a bumper crop of *Calocybe indica* of the correct size that can slowly replace button mushrooms totally. Wishing you all very successful growing.

Letter

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Dear Mr. Mazumdar,

"Mushroom Today" পত্রিকার এপ্রিল-জুন, ২০০৫ সংখ্যাটি আমাকে পাঠানোর জন্য ধন্যবাদ। ঐ সংখ্যায় প্রকাশিত West Bengal Edible Mushroom Cultivators and Spawn Makers' Association কর্তৃক ২৪ জুন, ২০০৫ হোসেন শাহ্ পার্কে আয়োজিত আলোচনা সভার স্মরণিকাটিতে আমার বক্তব্যের উল্লেখিত অংশের চতুর্থ স্তবকে কিছু ভুল তথ্য সংযোজিত হয়েছে যার সংশোধন একান্তই প্রয়োজন। ঐ তথ্যগুলির সংশোধন নিম্নে উল্লেখ করা হল। পরবর্ত্তী সংখ্যায় ঐ তথ্যগুলির সংশোধন প্রকাশ করতে আমি বিশেষ ভাবে অনুরোধ করছি।

চতুর্থ স্তবকের সংশোধন ঃ- "উনি বোতাম মাশরুমের বিকল্প হিসাবে দুধ ছাতু বা মিল্ক মাশরুম — *Calocybe indica* উৎপাদন ও গ্রহণ করতে বলেন। উনি কলিকাতা বিশ্ববিদ্যালয়ে ডক্টর রবীন্দ্র প্রসাদ পুরকায়স্থের তত্ত্বাবধানে এই মাশরুমের খাদ্য উপাদান ও গঠনগত চরিত্র বিশ্লেষণ এবং কৃত্রিম উপায়ে উৎপাদনের বিভিন্ন পর্যায়গুলি নির্ণয় করেন। এই মাশরুমটি সত্তোরের দশকের গোড়ায় ডক্টর পুরকায়স্থ ও তাঁর এক ছাত্রী ডক্টর ওইন্দ্রিলা চন্দ কর্তৃক সনাক্ত ও নামকরণ, খাদ্যপযোগিতা বিশ্লেষণ ও কিছু গুণগতমান নির্ধারিত হয়। ঐ দশকেই ডক্টর পুরকায়স্থ ও ডক্টর নায়কের প্রচেষ্টায় সারা পৃথিবীর মধ্যে এই মাশরুমটি কৃত্রিম উপায়ে প্রথম উৎপাদিত হয়। উৎপাদনের প্রথমদিন ঐ মাশরুম উনাদের গবেষণাগারে আনন্দমুখরিত এক ঘরোয়া অনুষ্ঠানের মাধ্যমে গৃহিত হয়।"

শুভেচ্ছান্তে

তাং - ২৬.৯.২০০৫

দীপক কুমার নায়ক

সংবাদ ঃ উত্তরবঙ্গ সংবাদ, ৮ই সেপ্টেম্বর, ২০০৫

উত্তর-পূর্ব ভারতে মাশরুম শিল্পের কেন্দ্রস্থল জলপাইগুড়ি

জলপাইগুড়ি জেলার মাশরুম উৎপাদনের অনুকূল আবহাওয়াকে কাজে লাগিয়ে এই শিল্পে জোয়ার আনা সম্ভব হয়েছে। গ্রামেগঞ্জে চলছে প্রশিক্ষণ শিবির। অনেকেই এই শিল্পকে কেন্দ্র করে স্বনির্ভর হয়েছেন। লিখেছেন *দিব্যেন্দুকান্তি মজুমদার*।

জলপাইগুড়ির মাশরুম প্রযুক্তি, উত্তর-পূর্ব ভারতের অর্থনৈতিক চিত্র বদলে দিচ্ছে। বছর দশেক আগে জলপাইগুড়ি জেলার লাটাগুড়ি ও বীরপাড়াতে বনবিভাগের সৌজন্যে ও সহায়তায়, বন সুরক্ষা কমিটির সদস্যদের জন্য, শুরু হয়েছিল মাশরুম প্রশিক্ষণ ও উৎপাদন। অর্থনৈতিক বিকল্প ও পুষ্টি বিকল্প হিসাবে গ্রামীণ জীবনে দ্রুত স্থান করে নিয়েছিল মাশরুম উৎপাদন ও গ্রহণ। সেই প্রকল্পের সূত্র ধরে, জলপাইগুড়ি সদর ও জেলা হয়ে উঠেছে, উত্তর-পূর্ব ভারতে মাশরুম শিল্পের কেন্দ্রস্থল। উত্তরবঙ্গের সব জেলাতো বটেই, সন্নিহিত সিকিম, অসম, বিহার, ভুটান, নেপাল এমনকি দক্ষিণবঙ্গের মাশরুম শিল্পের সঙ্গে যুক্ত ব্যক্তিরা দিনরাত ছুটে আসছেন এই শহরে, মাশরুম সংক্রান্ত পরামর্শের জন্য।

বর্তমানে প্রশাসনের সহযোগিতায়, RSVY এবং SGSY প্রকল্পের মাধ্যমে, DRD Cell জলপাইগুড়ির তত্ত্বাবধানে, গ্রামে গ্রামে মাশরুম প্রশিক্ষণ শিবির করা হয়েছে। এখানে অনেকেই এই প্রযুক্তি গ্রহণ করে স্বনির্ভর হওয়ার প্রচেষ্টা নিয়েছে। বিভিন্ন স্বয়ম্ভর গোষ্ঠীদের এই প্রকল্পের মাধ্যমে আর্থিকভাবে স্বচ্ছল করার উদ্যোগ নেওয়া হয়েছে।

এই অঞ্চলের মাশরুম উৎপাদনের উপযোগী আবহাওয়াকে কাজে লাগিয়ে, এখানকার মাশরুম উৎপাদনে জোয়ার আনা যায়। বর্তমানে এই উদ্যোগ গ্রহণ করেছেন এলাকার কিছু বিজ্ঞানী। মূলত তাদের উদ্যোগে ও সহযোগিতায় চলছে জেলার বিভিন্ন সরকারি ও

বেসরকারি মাশরুম প্রকল্পগুলি।

সারা দেশে মাশরুম শিল্পের প্রাণকেন্দ্র হিসাবে জলপাইগুড়িকে তুলে ধরতে তারা এখানে গড়ে তুলতে চলেছে, ভারতের প্রথম আধুনিক মানের মাশরুম গবেষণা ও প্রশিক্ষণ কেন্দ্র। এই গবেষণা কেন্দ্রে খাদ্যপোযোগী মাশরুম ছাড়াও আন্তর্জাতিক চাহিদার ওষুধি মাশরুমের সম্ভাবনা খতিয়ে দেখতে প্রকল্প চালু হবে। এলাকার প্রাকৃতিক পরিবেশে জন্মানো বিভিন্ন মাশরুমের উৎপাদন পদ্ধতি, চাহিদা ছাড়াও সেই মাশরুমের ওষুধি এবং খাদ্যমূল্য নিয়ে গবেষণা করা হবে। এখানে বিশেষভাবে উল্লেখ করা যায়, সন্নিহিত এলাকায় অনেক মাশরুম প্রাকৃতিক পরিবেশে জন্মায়, যাদের ওষুধি মূল্য অপরিসীম।

এই মাশরুম থেকে তৈরি করা হয় এমন সব ওষুধ যা ব্যবহার করা হয় জটিল রোগের ক্ষেত্রে যথা — রক্তে কোলেস্টেরল -এর মাত্রা হ্রাস করতে, রক্তাল্পতা দূর করতে, ভাইরাস, ব্যাকটেরিয়া জনিত রোগ প্রতিরোধ করতে ক্যানসার নিরাময় ও প্রতিরোধে বার্ধক্য রোধ করতে কেমোথেরাপি চলাকালিন পথ্য হিসাবে। এছাড়াও রয়েছে এর আরও অজানা অনেক সম্ভাবনাময় দিক।

যে সব মাশরুমের ওষুধি গুরুত্ব বেশি, সেই সব মাশরুমের আন্তর্জাতিক বাজারে বিপুল চাহিদা রয়েছে। গবেষণার মাধ্যমে পদ্ধতি নিরুপণ করে, ওই সব মাশরুম উৎপাদন করতে পারলে তা আন্তর্জাতিক বাজারে সরবরাহ করা সম্ভব।

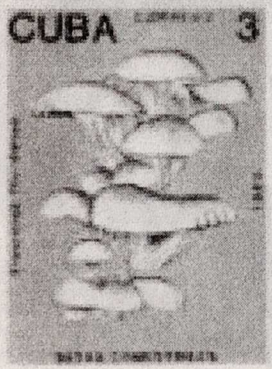
গবেষণাগার ও প্রশিক্ষণ কেন্দ্র স্থাপিত হলে, এখানে উক্ত বিভিন্ন ধরণের মাশরুম উৎপাদন পদ্ধতি নিয়ে প্রশিক্ষণ ও গবেষণা করার সুযোগ থাকবে।

এছাড়াও থাকবে আন্তর্জাতিক যোগাযোগ ব্যবস্থা, যার মাধ্যমে সারা বিশ্বের মাশরুম শিল্পের সঙ্গে পরিচিত হবে জলপাইগুড়ির নাম। আন্তর্জাতিক মাশরুম মানচিত্রে চিহ্নিত হবে জলপাইগুড়ি। এই অঞ্চলের অর্থনৈতিক পরিকাঠামো বদলে দিতে পারে এই মাশরুম শিল্প ও গবেষণা কেন্দ্র।

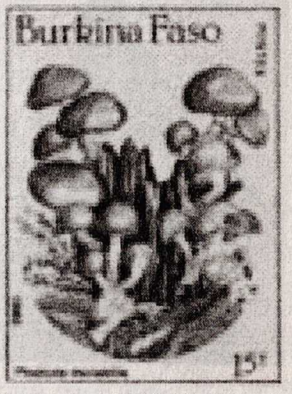
MUSHROOM STAMPS

Clitopilus prunulus

Pholiota spectabilis
***(Pholiota* Genus)**



Pleurotus floridanus
***(Pleurotus* Genus)**



Pholiota mutabilis
***(Pholiota* Genus)**

Editor in his Laboratory

রান্না - ১০৪

ভাপা মাশরুম

উপকরণ ঃ-

টাটকা মাশরুম - ১০০ গ্রাম,
কাঁচালঙ্কা - ৫টি,
সরষে - বড় চামচের দু চামচ,
নারকেল - ১/২ খানা,
জল - চা কাপের ১ কাপ,
হলুদ গুঁড়ো - ১ চামচ,
সরষের তেল - ৩ চামচ,
নুন - প্রয়োজন মত।

পদ্ধতি ঃ-

মাশরুম চিরে লম্বা ফালিতে কেটে নিন। নারকেল কুরিয়ে জল ছিটিয়ে মিহি করে কুটুন। সরষের সঙ্গে ২টি কাঁচা লঙ্কা বেটে রাখুন। ৩টি কাঁচালঙ্কা চিরে নিন। মাশরুম ফালির সঙ্গে চেরা লঙ্কা, বাটা সরষে, নারকোল বাটা মিশিয়ে দিন। মিশ্রণের ওপর হলুদ ছড়িয়ে সরষের তেল যোগ করুন। নুন ছিটিয়ে দিয়ে কাপের বাকী জলটুকু ঢেলে দিন। আলতো করে নেড়ে দিন মাখাটি প্রেসার কুকারে ভরে ভাপে সেদ্ধ করুন। পুরো প্রেসার ওঠার ২ মিনিট পরে আঁচ থেকে নামিয়ে রাখুন। প্রেসার পুরো নেমে গেলে ঢাকনা খুলে ভাপা মাশরুম গরম গরম পরিবেশন করুন।

Receipe - 105

Cream of Mushroom Soup

Ingredients :-

Mushrooms - 100 gms.,
Cornflour - 2 tbsp.,
Milk - 1/2 cup,
White Pepper - 1/4 twsp.,
Salt - to taste,
Cream - 4 tbsp.,
Butter - 1 tbsp.,
For Stock :-
Carrot - 1 medium size,
Masoor Daal - 2 tbsp.,
Onion - 1,
Potato - 1,
Cloves Garlic - 4.

Method :- Peel and cut the carrots, onion and potato and wash daal. Add 5 cups of water and boil in pressure cooker for 5 minutes. Cool, blend in mixer and sieve. Your stock is ready. Chop the mushrooms very fine. Heat butter in a pan. Fry the mushrooms lightly and keep aside. In the remaining butter, fry the cornflour slightly. Add milk and stock. Belnd 3/4 mushrooms and stock in mixture. Boil and add remaining mushrooms. Let it simmer for 3 to 4 minutes. Serve hot topped with cream.

রান্না - ১০৬

মাশরুম রোল

উপকরণ ঃ-

শুকনো মাশরুম - ২০ গ্রাম,
ময়দা - ১০০ গ্রাম,
ভুট্টার গুঁড়ো - ৫০ গ্রাম,
মিষ্টি আলু - ৩০০ গ্রাম,
পেঁয়াজ - ৩০০ গ্রাম,
ঘি - ২০০ গ্রাম,
ভাজা জিরে গুঁড়ো - ২ চামচ,
গোল মরিচ গুঁড়ো - ১ চামচ, নুন - প্রয়োজন মত।

পদ্ধতি ঃ- মিষ্টি আলুর পরিবর্তে, আলু, টেপিওকা, কুমড়ো প্রভৃতি ব্যবহার করা চলে। ঘিয়ের পরিবর্তে সরষে বা বাদাম কিম্বা সূর্যমুখীর তেল ব্যবহার করা যায়।

মিষ্টি আলু সেদ্ধ করে চটকে ময়দা ও ভুট্টা গুঁড়োর সঙ্গে প্রয়োজন মত জল দিয়ে ভাল করে মাখুন। এই মাখা তৈরী করার সময় অল্প পরিমাণে নুন মেশানো চলে ও ময়ান হিসাবে ঘি ব্যবহার করা যায়। মাশরুম সেদ্ধ করে নিন ও পেঁয়াজ কুচিয়ে রাখুন। কড়াই বা সসপ্যানে ঘি গরম করে মাশরুম ও পেঁয়াজ আধভাজা করে তুলে নিন। তুলে নেওয়ার আগে ভাজা জিরের গুঁড়ো ছড়িয়ে নেড়ে নিন। এরপর গোলমরিচের গুঁড়ো ছিটিয়ে নামিয়ে নিন। মাখা ময়দা রুটির আকারে ঘি দিয়ে নরম করে ভেজে তুলুন। মাশরুমের পুর ভাজা রুটির মধ্যে দিয়ে সামান্য লেবুর রস, বীট নুন বা সস দিয়ে রোল করে গুটিয়ে নিন। গরম গরম পরিবেশন করুন।

Receipe - 107

Mushroom Soup

Ingredients :-

Fresh Mushrooms - 500 gms.,
Butter - 50 gms.,
White flour (Maida) - 2 table spoon,
Salt - to taste,
Ground spices (Cardamom, red chillis, cinnamom and pepper) - 4 kg.,
Milk - 1 litre.

Method :-

Clean and chop the fresh mushrooms. Melt butter in a pan and saute the mushrooms in it. Add milk and let the mixture boil for five to seven minutes. Dissolve maida in a little cold water and add to the boiling milk and mushroom mixture to thicken it. Give two boils and add salt and spices. Serve hot.

রান্না - ১০৮

মাশরুম পোস্ত

উপকরণ ঃ-

মাশরুম - ১০০ গ্রাম,
পোস্ত - ৩ চামচ,
নারকেল - ১/২ খানা,
কাঁচা লঙ্কা - ৫টি,
হলুদ গুঁড়ো - ১/২ চামচ,
সরষের তেল - ৩ চামচ,
জল - ১ কাপ,
নুন - প্রয়োজন মত।

পদ্ধতি ঃ- মাশরুম টুকরো করে কেটে আন্দাজ মত নুন ও হলুদ মাখিয়ে একটা প্যানে রাখুন। পোস্তদানা গরম জলে ১০ মিনিট ভিজিয়ে ছেঁকে নিন। নারকেল কুরিয়ে তার সঙ্গে পোস্তদানা ও দুটি কাঁচা লঙ্কা কাপের জল ছিটিয়ে মিহি করে বেটে নিন। এরপর নারকেল ও পোস্ত দানা মাশরুমের সঙ্গে মেশান। তেল ছড়িয়ে দিন। নরম আঁচে বসিয়ে ধীরে ধীরে নেড়ে দিন। অল্প ভাজা হলে নুন ছড়িয়ে কাপের বাকী জলটুকু যোগ করুন। নেড়ে নিয়ে বাটিরে মুখে ঢাকনা লাগিয়ে দিন। নরম আঁচে ১০ মিনিট রান্না হওয়ার পর নামিয়ে নিন।

নারকেলের পরিবর্তে সরষে অথবা কোন কিছু না ব্যবহার করা যায়। স্বাদ বাড়ানোর জন্য আঁচ থেকে নামানোর পর সরষের তেল বা ঘি ছড়িয়ে দিয়ে পাত্রটিকে পরিবেশনের সময় পর্যন্ত ঢেকে রাখতে পারেন।

Receipe - 109

Mushroom and Paneer

Ingredients :-

Mushrooms - 500 gms.,
Paneer - 250 gms.,
Onion - 100 gms.,
Tomatoes - 100 gms.,
Ghee - 2 table spoon full,
Salt - to taste,
Garam masala - 1 tea spoon full.

Method :-

Wash mushrooms and cut into two halves lengthwise. Dice paneer into 2" cubes. Chop onions and cut tomatoes into small pieces. Heat ghee in a pan, put chopped onion in it and let it brown, add tomatoes to it. Simmer it for 5 minutes. Add mushrooms, paneer and salt. Cook at slow fire water of mushroom dries up. Add garam masala and serve hot.

রান্না - ১১০

মাশরুম চাটনি

উপকরণ ঃ-

শুকনো মাশরুম - ২০ গ্রাম বা
কাঁচা মাশরুম - ২০০ গ্রাম,
পেঁপে - ১ কে.জি.,
চিনি - ৩০০ গ্রাম,
কিসমিস - ৫ গ্রাম,
তেঁতুল - ১৫০ গ্রাম,
টমেটো - ৩০০ গ্রাম।

পদ্ধতি ঃ-

সেদ্ধ মাশরুম ছোট ছোট করে কেটে তেঁতুল গোলা জলে ভিয়ে রাখুন। পেঁপে পাতলা ও ছোট করে (পটেটো চিপসের ত) কেটে অল্প জলে সেদ্ধ করুন। অল্প জলে চিনি গুলে কিসমিস জিয়ে রাখুন। কড়াই বা সসপ্যান গরম হলে টমেটো কেটে ছেড়ে ন। গরম হলে চিনির জল ও কিসমিস এবং মাশরুম ও পেঁপে াগ করুন। ফুটতে থাকলে তেঁতুলগোলা জল পরিমাণগত মেশান। ন হয়ে এলে নামিয়ে নিন। ঠান্ডা হলে পরিবেশন করুন।

Receipe - 111

Mushroom Pancakes

Ingredients :-

Flour - 110 gms. (1 cup),
Milk - 1-1/4 cup,
Salt - a pinch,
Water cold - 1-1/4 cup,
Egg, Water, Oil or Butter - 2 tsp.

Method :-

Sieve flour and salt together into a bowl. Make a well in the centre and drop in egg. Beat the mixture well. gradually beat in just enough liquid to make a smooth batter. There should no limps. Allow to stand for a few minutes and then gradually mix in the rest of the liquid. Allow the batter to stand for 20 minutes I and then give a final whisk. Put about 1/2 tsp. of oil into frying pan and heat till it smokes. Put the butter into hot pan to cover the bottom thinly. Tilt the pan while pouring so that butter spreads evenly all over the bottom of the pan. Cook quickly one side until golden brown (lift the edge of the pancake with a palette knife to see if it is ready). Toss or turn to cook on the other side.

রান্না - ১১২

মাশরুম স্যান্ডউইচ

উপকরণ ঃ-

শুকনো মাশরুম - ২০ গ্রাম,
টক দই - ৫০ গ্রাম,
আলু - ৩০০ গ্রাম,
গোলমরিচ গুঁড়ো - ১ চামচ,
মাখন - ১০ গ্রাম,
নুন - প্রয়োজনমত।

পদ্ধতি ঃ-

রোদে শুকোনো মাশরুম ভালো করে সেদ্ধ করুন, বেশ নরম হলে নামিয়ে জল ঝরিয়ে নিন। ঠান্ডা টক দই ফেটিয়ে নিয়ে সেদ্ধ মাশরুম ভিজিয়ে রাখুন, সেদ্ধ আলু খোসা ছাড়িয়ে আলু ভাজার মত সাইজে কুঁচিয়ে নিন। পাউরুটি দুটি স্লাইস একসাথে নিয়ে কোনাকুনি কেটে দিন। ত্রিভুজাকৃতি পাউরুটির স্লাইসের পিঠে মাখনের হালকা প্রলেপ দিন। মাশরুম ও আলু ছড়িয়ে নুন ও গোলমরিচের গুঁড়ো ছিটিয়ে দিন। ভাপে গরম করুন ও গরম গরম পরিবেশন করুন।

Receipe - 113

Mushroom Yakni

Ingredients :-

Fresh Mushrooms - 200 gms.,
Cloves - 2,
Fennel powder (saunf) - 5 gms.,
Salt - to taste,
Aromatic ginger - 5 gms.,
Oil - 25 gms.,
White cumin seeds - 5 gms.,
Curds - 250 gms.,
Asafoetida powder a pinch.

Method :-

Wash and cut mushrooms into halves. Heat oil and deep fry the mushrooms. Take out mushrooms when golden in colour. Put asafoetida, cloves and cumin in the same oil. When cumin carckles put fennel (saunf) and aromatic ginger (saunth) and stir slowly. Add curds to this mixture and keep on stirring for few second and then add the deep fried mishrooms and cook it until the mushrooms are soft.

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MUSHROOM TODAY

আজকের মাশরুম

A Monthly Newsletter on Mushrooms

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