



□ Use baskets for collection and transport to allow spore dispersal and to maintain quality.

□ Avoid using plastic bags or similar containers



Mushroom in plastic bags

□ Traditionally bamboo baskets (kuto) were used for harvesting mushroom. Due to difficulty in procuring them and for convenience even baskets made from synthetic materials were distributed to some mushroom collectors to discourage the use of air tight bags.



Mushrooms respire even after harvest, and mushroom in airtight bags become wet and can get mashed. Such bags will make the mushroom to be less desirable for consumption, as well as reduce its shelf life and become unfit for sale. This is a real concern when it has to be exported.

Sustainable Harvesting, Standards and Marketing of Wild Mushrooms

Mushroom Harvesting

- Endeavour to supply quality mushroom
- Mushroom can be harvested within the declared time frame only
- Minimum size for matsutake is set at 7.5 cm
- Do not disturb litter, moss or plants
- Should not leave behind trash
- All the above are liable for fining

Unhealthy Practices

- Looking for mushroom before the harvesting season.
- Harvesting of very young mushroom
- Adulteration with other materials
- Disturbance of substratum (soil)
- Damage to host plants
- Using polythene bags Vs baskets
- Marketing slimy mushroom

Matsutake Export Standards

- Graded: A & B
- Boxes clearly and uniquely labeled
- Mushrooms should not be damaged/spoilt

Grade A

- The minimum size for A grade matsutake is 7.5 cm in height
- Maximum 5% -10% open veil is permissible



Grade B

- They should not be over-matured which could result in deformed shape and dark gills
- Grade B matsutake mushroom should not be mixed with grade A to avoid adulteration



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**NATIONAL MUSHROOM CENTRE,
SEMTOKHA
DEPARTMENT OF AGRICULTURE
MINISTRY OF AGRICULTURE**



Sustainable Harvesting of *Tricholoma matsutake* (Sangay shamong)

“Sustain production of mushroom and income of the farmers through proper harvesting methods and marketing”

Introduction

Matsutake (*Tricholoma* spp.) are a group of commercially important mushrooms that are increasingly threatened by over collection. Ecologically sustainable management of matsutake has been hindered by the lack of essential information such as reliable distribution maps. Although a variety of spatial distribution models have been applied to map many different plants, this has rarely been attempted for mushrooms.



As a seasonal delicacy favored by the Japanese, matsutake have become a commercially important wild mushroom. Consumption in Japan is approximately 3000 tones per year, of which Japan produces 1000 tones in a good year. The remainder is imported mainly from Korea, China, North America, Bhutan etc. “Matsutake” or Sangay Shamong



in Dzongkha translates literally as “pine mushroom” from the Japanese. Originally, matsutake referred specially to *Tricholoma Matsutake*, but subsequently the name refers to a group of similar mushrooms while the taxonomy of these mushrooms is still under debate, it is generally accepted that there are circa 15 species distributed worldwide borne and perennial mycorrhizal fungi. They develop a symbiotic association with the roots of specific trees.

Mushroom are also important to rural livelihoods in many parts of the world. Naturally many species that command high prices, such as matsutake, cordyceps and truffles, are increasingly at risk from over exploitation and improper ecosystem management. This is cited as the case in northwest Yunan, China and which could be compared to Bhutan also. Hence, growing concerns have focused on how to properly use and protect the mushrooms. Development of sustainable harvest plans requires knowledge of mushroom distribution; however this information is often scarce or poor.

Matsutake mushroom is symbiotic fungus and forms mycorrhizae on the fine roots of higher plants. The tree supplies ready sugars to the matsutake fungus, and in return, the matsutake helps the tree in absorbing water and mineral by increasing the surface area of absorption.

In Japan and Korea they grow mostly in red pine forest but in Bhutan they are commonly found in oak and spruce forest. Soils that are

relatively warm, well drained, and with thin litter and organic layers are favorable to the development of the *Tricholoma matsutake* mycelium.

1. Mushroom Biology and Ecology



Mushrooms are the ‘fruits’ or reproductive part of the fungus. The rest of the fungus is the vegetative part, comparable to the fruit tree but composed of a network of hyphae



(threads) or (bundles of hyphae) collectively known as mycelium is found in the substrate/soil in this case. Collection of mushroom is comparable to collection of fruit. Picking fruit one year doesn’t affect future production as long as the tree is not damaged and it is fed with nutrients and water. Likewise, picking mushrooms one year without damaging the mycelium and soil in which it thrives will not reduce future mushroom production.

Recommendation in Mushroom Habitat Management and Mushroom Harvesting

- Mushroom should be harvested whole for quality product and to avoid damage to the mycelium
- Avoid harvesting undersized mushroom; since to look and harvest these, the forest floor has to be dug up.
- Avoid disturbance of the soil and the surrounding area. The mushroom mycelium thrives and depends on these for their survival and mushroom production. Fungi have their vital role in the ecosystem

