

# **Studies on collection and marketing of *Morchella* (Morels) of Utror-Gabral Valleys, District Swat, Pakistan**

**By**

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## **Abstract**

This paper is based on a research project carried out to study the collection and marketing status of morels in the remote HinduKush-Himalayan regions of Utror and Gabral, Pakistan. Eight species of morels were found to be collected in the project area during the months of March to July. *Morchella conica* and *Morchella esculenta* were the major species collected in the area. These morels are sold in the local markets of Madyan and Mingora, from where they are exported to France, Belgium, Switzerland, Austria and Germany. Morels thus provide a vital source of income to the poor population of Utror and Gabral. Morel collectors include 38.0% women, 37.0% men and 25.0% children. Huge quantities of morels are lost each year due to improper storage and collection techniques.

**Key words:** Morels; Marketing; Hindukush-Himalayas; Commerce

## **Introduction of Study Site**

The Utror-Gabral valleys are situated in the north western part of the District Swat, Pakistan. The project area has unique flora as it occupies nexus of the three great mountain ranges i.e. Himalayas, Hindukush and Karakoram. The altitude of Utror is 2,225 meters and Gabral is 2,550 meters from the sea level. Both of these Valleys comprise Utror Union Council, Tehsil Kalam. The famous Kandol Lake is situated in the area.

## **Location, Boundary and Area**

The area is situated in the North West corner of District Swat. It lies between 35°–20' to 35°-48' North latitude and 72°-12' to 72°-32' East longitude.

The area is surrounded by Chitral District on the north, Swat District on east and south and Upper Dir district on the west.

The total population of the project area is 10126 while its area is 114627 hectares. Utror, Gabral (Gul Abad and Gujar Gabral), Sazgal, Behan, Baila, Karin, Kanai and Jabba (Upper and Lower) are the important villages (Anonymous, 1998).

## **Climate**

The area has a typical dry temperate zone climate. The winter season is very cold and as a result large number dwelling in the upper parts migrate to lower areas along with their live stock. These migrants return on the onset of spring. The coldest months are December, January and February during which snow falls are frequent. The valleys remain under snow cover for about four months. The snow started melting in April. June, July and August are the hottest months of the year while during September and October, the climate is very pleasant. Rain is received in large amounts during March and April. The summer and autumn are relatively dry seasons. Mean annual maximum temperature is 61.9 °F while mean annual minimum temperature is 39.37 °F. Mean annual snow fall is 331.01 cm while mean annual rain fall is 52.43 cm.

## **Rivers and Streams**

Utror river is the main river which meets Ushu river at Kalam, thus giving rise to Swat river. The tributaries of Utror river includes, Gujar khawar, Gabral sin, Desan khawar and Battal khawar.

## **People of Utror-Gabral Valleys**

The population includes Kohistanis, Gujars, immigrants from Indus Kohistan, Malazai (from Dir) and other nomadic tribes. However, Kohistanis and Gujars form the bulk of the local population.

### **Kohistanis**

Kohistanis are fair colored, hospitable and simple people. They are considered to be the real natives of Swat. They were forced by the invading Yousafzai tribe of Pathans to live in the remote upper parts of District Swat. The Kohistanis are now living in and around Kalam, Ushu, Utror and Gabral valleys. The Kohistanis are the land owners and also get royalty in the local forest income from the Government.

### **Gujars**

The Gujars are the major community of Gabral valley. They are the land owners in the valley but have no share in forest royalty. They are mainly farmers and keep cows and buffalows.

### **Ajars**

There are some Gujars who spent nomadic life and are called Ajars. They keep herds of sheep and goats. Ajars pay rent to the Gujars of Gabral for utilizing their pastures during summer season.

### **Malazai and others**

These are not permanent residents of Utror and Garal Valleys. They visit the area during the month of March and leave it in early November. The bulk of these nomads include Malazai tribe from upper Dir District. These nomads have big herds of sheep and goats. They graze their herds in the green pastures of the area and work as peasants for locals.

### **Languges**

The local languages are Kohistani and Gujro. However, Pushto is also under stood in the area. Kohistani is an interesting language because it has no alphabets and hence no body can write it. Gujro language is actually Punjabi with some what different dialect (Hamayun et al. 2003).

### **Brief Introduction of Morels**

Morels belong to family Helveliaceae and class Ascomycetes of Fungi. Being saprophytic in nature, they get nourishment from decaying organic substances. Some morels like *Morchella conica* and *Morchella rotundus* are believed to have some kind of association with specific plants as *Morchella conica* is often found under conifers and *Morchella rotundus* with small herbaceous plants.

Morels exhibit cylindrical structures. Pileus is the upper part of a morel and weight about 70 to 80% of the total weight of the plant. The pileus show brown, yellow, black and pale colors. The color of pileus is imparted by pigmented oil droplets present in the cells of pileus, which vary from species to species. The pileus becomes folded in the form of ridges and depressions like honey comb.

The stalk or stipe of morel is 1.0 to 4.0 cm long, 0.5 to 3.0 cm thick, hollow and of variable shapes. At first the stalk is whitish to pale grey but at maturity become grayish brown. The stalk supports the pileus. Its weight is about 20 to 30% of the total morel weight.

### **Materials and Methods**

The present investigations were carried out during the year 2002. The research area was extensively visited from March to July as *Morchella* species are collected during this period. Local collectors, local purchasers of *Morchella* and exporters were interviewed in order to get information pertinent to morel collection, storage, preservation and marketing. Questionnaire was adopted for this purpose. The data obtained from the questionnaire was cross checked with available literature.

### **Results and Discussion**

Morels are collected in Utror and Gabral valleys during the months of March to July. Locally they are called Kasee or Gujai. Nine species of *Morchella* are collected in the area. The collectors sold it to local shopkeepers or in the markets of Madyan and Mingora. *Morchella* fetch high prices and thus play an important role in the economy of Utror and Gabral. Following species of *Morchella* are collected from the project area and marketed abroad.

- ***Morchella conica***

It is the most common and traded morel of the area. Locally it is called Kohistani Kasee/ Gujai. The body ridges of *Morchella conica* extend longitudinally and run parallel from base to top. *Morchella conica* exhibit yellow color in the beginning but on maturity it changes to grayish or brownish. It is found up to 5000 meter altitude. *Morchella conica* is primarily found under coniferous trees like *Pinus willichiana*. It makes 42% of the total morels collected in the area.

When fresh, its size ranges from 4 cm to 25 cm but after drying the size reduces and ranges from 0.1 cm to 11 cm.

- ***Morchella esculenta***

*Morchella esculenta* is locally called Speena (white) Kasee/Gujai. This species is found under thick coniferous vegetation. The color is white in the beginning but changes to pale or yellow brown at maturity. It makes 29% of the total collection of morels in the area.

In fresh form its size varies from 2 cm to 25 cm while on drying the size reduces to 0.1 to 10 cm.

- ***Morchella ultima***

*Morchella ultima* is very much similar to *Morchella esculenta* morphologically and the only visible difference is that of color (yellowish) and habitat. This species of *Morchella* is usually found under *Berberis* species. Locally it is called Ziarra (yellow) Gujai. Of total collection of morels, it is about 6%. When fresh, its size ranges from 4 cm to 12 cm but the size reduced up to 2 to 6 cm on drying.

- ***Morchella rotunda***

This species of *Morchella* exhibit rounded shape. Locally it is called Ghounda (rounded) Gujai. Its color is yellow but on vigorous contact to a substance, its color changes to blackish. It amounts only 4% of the total collection of morels in the area. In fresh form, its size varies from 5 cm to 25 cm but after drying the size reduces (3 cm to 9 cm).

- ***Morchella delicosa***

This pencil shaped morel is locally called Pashakalai Gujai as it is found and collected during the months of July and August. It is usually found under apple trees and sides of streams and rivers. *Morchella delicosa* is of yellowish color. It makes about 10% of the total collection of morels in the area. When fresh, its size varies from 6 cm to 30 cm but on drying the size ranges from 4 cm to 15 cm.

- ***Morchella semlibera***

This morel is locally called Topai Sawree (cap on head) Gujai. It is like *Agaricus* spp. In appearance but got no gills and annulus. It grows under the pine trees during spring and rainy season. When young, it show pale color but on maturity changes to blackish. It amounts 4% of the total morel collection from the area. Fresh and dried size of *Morchella semlibera* varies from 2cm to 10 cm and 0.1 cm to 4 cm respectively.

- ***Morchella elata***

This morel is similar to *Morchella delicosa* or *Phallus impudicus* morphologically. Locally it is called Da Khawar Gujai. It is found in shady and damp places. It makes about 2% of the total morels collected in the area. When young, its size ranges from 5 cm to 25 cm but on maturity the size reduces i.e. from 3cm to 13 cm.

- ***Morchella crassipes***

The pileus and stipe are thick as compared to other morels. Locally called Dabbala (thick) Gujai. *Morchella crassipes* grow on soils with rich organic components. This morel constitutes 3% of the total collection of morels in the area. The size varies from 4 cm to 15 cm when fresh but reduced to 2cm – 13 cm after drying.

## Collection of morels

Morel collectors are usually poor villagers. Morel collection is there part time activity besides farming and live stock keeping. The collectors include 38.0% women, 37.0% men and 25.0% children. Most of men and women collectors are of ages between 18 to 35 years. They collect morels during spring and early summer season which starts from March to July and sell it in the local market to earn some money. One can see a person coming from a hilltop

with a bundle of fuel wood on his head and a bag of medicinal plants and morels in his hands. He handover his bag of medicinal plants and morels to local Pansaris (Dealer of morels and medicinal plants) and put in his pocket whatever money he gets (Hamayun et al. 2003).

According to Choudhary et al. (2000) about 500 families are involved in medicinal plant and morel collection in Swat District and they collect 5000 tons of medicinal plants and morels annually.

Morel collection is a hectic job and requires a lot of physical exertion, devotion and passion. The poor villagers of the area take keen interest in morel collection as it provide them an important source of income. The other reason of its collection is mythical as people in the area believe morel collector as a fortunate person. The collector often put antimony in his/her eyes as there is a myth that such collectors will collect more morels. Some times the collectors spent days in the forest collecting morels and other plants of economic importance, especially medicinal plants like *Acorus calamus*, *Podophyllum hexandrum*, *Paeonia emodi*, *Valeriana jatamansi* and *Bistorta amplexicaulis*. In most cases, the collectors sell morels in fresh form to the local dealers or in the markets of Madyan and Mingora after drying the morels.

### **Drying procedure of morels**

Fresh morels contain huge amounts of water. It is clear from the fact that one kg fresh morels reduces to 100 grams after drying process. Drying is done by collectors or local dealers called Pansaris. The traditional method of drying morels is to make a garland of morels and hang it to the wall or house rafters. In favorable climatic conditions, drying process takes 4 to 5 days. After drying the morels are stored.

### **Storage of morels**

Morels need a lot of care in storage as their quality deteriorates very quickly. The prime successful storage technique is to keep morels dried and cool with a little ventilation. They are kept in closed chambers as in open they may absorb moisture and start to decompose. Occasionally, insect larva infests the morel during storage. In such cases, morels are properly fumigated with insect killing tablets in a separate chamber. Some times, morels get spoiled by mosses which grow on morels in hot humid conditions. The spoiled morels are washed with water but it deteriorates the quality of morels as they become black.

### **Causes of morel spoilage**

Main causes of morel spoilage are the following.

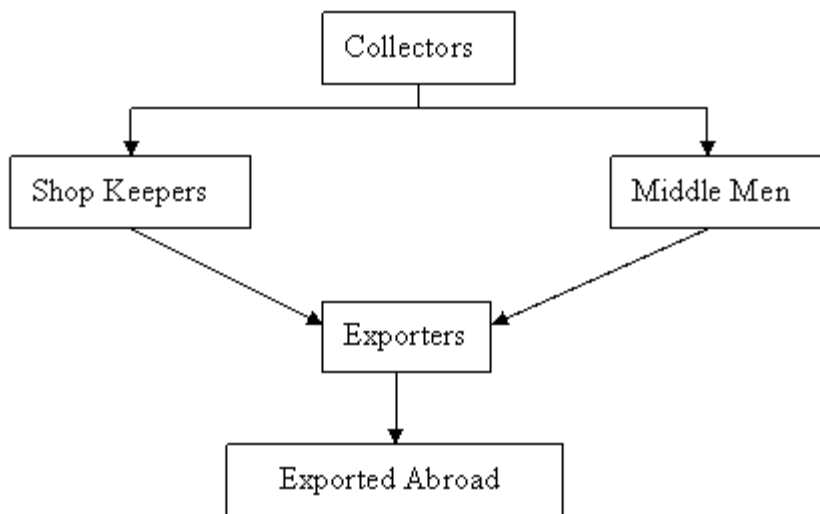
1. Hot and humid conditions cause great loss to morels as hot conditions and increased moisture contents make the morels susceptible to insect attacks and moss growth.
2. When fresh morels are kept in air tight plastic bags, spoilage take place as a result of suffocation.
3. While growing, the morels got injured due to storms, running water or a piece of wood. Such morels become black after drying and counted as inferior quality.
4. Insects and ants also cause great damage to morels.

### **Marketing of morels**

Morels are collected from the forest and then finally exported to France, Belgium, Switzerland, Austria and Germany. The main species exported are *Morchella conica* and *Morchella esculenta*. About 90% of the total morel produce of Pakistan is collected from the Hindu Kush- Himalayan mountain ranges of North West Frontier Province of Pakistan. Morels are actually the growing gold of these mountain ranges.

The trade and earnings depends upon the export of morels which is based on quality control. The shopkeepers buy morels from the collectors. These purchases are made under certain rules made by dealers of morels. The shopkeepers pay the collectors on morels quality i.e. good quality fetch high prices while inferior fetch low. When the shopkeepers or middle men have sufficient stock, they sold it to exporters in the markets of Madyan and. The same rule of gradation is yet again followed.

A marketing chain of morels is given below.



### Prices of Morels

Prices of morels greatly depend upon the quality, processing and area of collection. The prices also vary from species to species. The price of *Morchella conica* is always higher than other species. One kg of dried morel fetches Rs.3000 to collector, Rs.9000 to the wholesaler, Rs.12000 in the National market and Rs.20000 in the International markets. Thus the exporters are the main beneficiaries followed by middle men. The collector get nominal benefits as prices are very low in the area as compared to international markets.

### Main Exporters of Morels in Pakistan

There are four main exporters of morels in Pakistan. They are

1. **Rehman Traders, Mingora**, purchase and export about 12000 to 17000 kg of morels per year.
2. **Salman Traders, Islamabad**, purchase and export about 15000 to 17000 kg of dried morels per year.
3. **M. Hussain and Co, Mingora**, purchase about 7000 to 10000 kg of morels each year.
4. **Essa Jaffer and Co, Karachi**, purchases about 5000 to 8000 kg of morels from Peshawar and exports it abroad.

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