

Morels and their production in natural environment of Jumla District, Nepal

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This paper investigates production, uses and trade of naturally growing morels of Jumla District. Two species of morels viz. *Morchella angusticeps* Peck. and *M. umbrina* Boud. have been recorded for the first time from this area as new to Nepal. Suggestions have been given to increase the production of morels.

Keywords: Morel, Cost benefit, Jumla District, Nepal.

Jumla (82°09'E - 82°18'E longitude and 29°15'N - 29°21'N latitude) is situated in between 2200 m and 4500 m (Dhaulidhar) above the mean sea level. It is one of the remote rural areas lying in western phyto-geographical region of Nepal. The area is food deficit and is associated with many natural and human hazards. The climate is warm subtropical to cold alpine. The temperature varies greatly between 28° and -7.0° C within three months (February and April).

The basins of Jumla district are cultivated. The forest type of the surrounding mountains are described elsewhere.

Morchella conica Pers. (morels) were previously reported from Nagarjun hills (Singh and Nisha, 1976); Manichur (Adhikari, 1991); Jumla (Adhikari and Durrieu, 1996); *M. deliciosa* Fr. (Singh and Nisha, 1976); Sydow and Butler, (1971). Jumla (Adhikari and Durrieu, 1996); *M. elata* Fr. from Siklis, Pokhara (Balfour-Browne, 1968); *M. esculenta* Pers. (Singh, 1966); from Manichur (Adhikari, 1991); Jumla (Adhikari and Durrieu, 1996); *M. smithiana* Cooke from Tukuhe. (Singh and Upadhyaya, 1978) and *M. vulgaris* (Pers.) Boud. from Jumla (Adhikari and Durrieu, 1996).

Morels in Nepal are locally known as Khoya chyan or Phuikhane chyan (Nepali), and Guchhi chyan (Hindi). Phuikhane literally means consumption after roasting on fire. In Jumla the fruit body of morels are used to heal the cuts, ulcers and colities. It is also used as light food drink during fever.

Materials and methods

The investigation was carried-out in 1999 to find out the number of species of morel growing in Jumla District. The season was found to be adverse (mostly dry) for growth and appearance of mushrooms in the investigated area, so the frequency of the species

was quite low. However, about 60 specimens of different fungi, which included the taxa of Myxomycetes, Ascomycetes and Basidiomycetes were collected. Some of these include the genera like *Innonotus*, *Coriolus* sp., *Polyporus* sp., *Chrysomyxa* sp., *Ustilago* sp., *Fuligo* sp., *Lycogola* sp. etc. The area around the district was intensively explored. The local people and traders were interviewed about the occurrence, growth and quantity of collection of morels in the area. The data from the District Forest Office (DFO) were taken to find out the traded amount.

Results and discussion

According to the local people the area for the collection of morels are Guthichaur, Garjinkot, Kartikswami, Depal Gaon, Sinja, Phui Gaon and Chechepari forest areas. The area has been inhabited by different castes, which are involved in morel collection, consumption and trade.

Different species of morels viz. *Morchella conica* Pers., *M. elata* Fr., *M. esculenta* Pers. and *M. vulgaris* (Pers.) Boud were found. Two species of morels viz. *Morchella angusticeps* Peck. and *M. umbrina* Boud. have been recorded for the first time from this area as new to Nepal. Some other species are yet to be identified. A preliminary report can be seen in Adhikari and Pokharel (1999).

For the last six years or so the economic importance of the morel found in Jumla District is on the rise. Usually each and every local inhabitant of the district is involved in collecting morels to uplift their socio-economic standard and meet the daily need. The amount of morels depends upon season and forest type and density, nearness of the forest, traditional knowledge about the mushrooms, nature of work and work load of the collectors, etc.

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During the favourable season, in the interval of one and half month, each person can collect 5 to 7 kg of dried morels. Collectors spend nearly ten hours a day for forty five days. After the collection, morels are dried either in the sun by sticking the morels in a string and hanging it on open place or by keeping them over fireplace. However the latter fetches lower price.

According to the local inhabitants the morels are found in larger quantity at Guthichaur, Garjungkot, Depalgaun, Kartikswami and Kundari. In 1999, due to adverse natural climatic condition in February, March and April the production of morels from the forest of Jumla District was found to be extremely low. The quantity of production could not be estimated in this investigation.

Two types of information were received viz. i) officially the production of morel was found to be around five tons (dry weight) in FY 1997/98. ii) according to the interviews with the local people and traders the production of morel was said to be more than five tons a year. In 1997-98 the price of the dried morels fluctuated between Rs. 3500 and 4000 per kg and in 1999 it was Rs. 5000.

The size and weight of the morels were found to differ as follows:

Sample No	Morchell conica		Weight (grams)
	Pileus (cm)	Stipe (cm)	
1	3.5 x 2.5	2.5 x 1.0	2.125
2	2.0 x 2.0	1.0 x 0.5	0.875
3	1.8 x 1.2	1.6 x 0.5	0.5
Morchella esculenta			
1	5.5 x 3.2	4.0 x 2.0	6.0
2	4.2 x 2.5	3.0 x 1.0	2.875
3	2.5 x 1.5	2.0 x 1.0	1.125
Morchella angusticeps			
1	4.7 x 3.0	6.5 x 3.0	4.125
2	4.0 x 2.3	5.0 x 1.8	2.5
3	3.8 x 2.0	4.0 x 1.0	1.375
Morchella elata			
1	2.5 x 0.8	1.5 x 0.5	1.250
2	2.1 x 0.7	1.2 x 0.4	1.1
3	1.5 x 0.5	1.0 x 0.2	0.8

Though small in size *M. elata* is found to be heavier than other species. It is observed that *M. conica*, *M. esculenta* and *M. vulgaris* are respectively heavier than *M. angusticeps*.

Cost of morel

The local collectors sell the morels at a rate of 1 to 3 Rs/specimen. It was known that the morels were sold by the local inhabitant to the local traders at the rate of 3500 to 5000 Rs/kg.

The wages of labor is Rs 100/adult male and 80-90 Rs/adult female. Assuming that one can collect 7 kg of dried morels in 45 days, following calculation indicates the cost of morel:

Fooding @ Rs. 65/day minimum for 45 days	=	2925/-
Labor @ Rs. 100/day for 45 days	=	4500/-
Total Rs.	=	7425/-

i.e.the minimum rate of morel per kg. should be Rs 7425/ at Jumla if the morel is collected by adult male, and it should be Rs 7000 to 7500/kg, if collected by an adult female. However the value of morel remains low if :

- the collector is in dire economic state and is in extreme need of hard cash
- the local collector has already received an advance payment from Indian traders
- the weather remains favourable for drying morel
- the condition of collected material are rotten
- the collected specimens are not well separated
- the species are found in huge plenty

Though morels are traded to India by locals, yet their exact data of collection and trade have not been clearly known (Adhikari, 1994, 1996).

The collection and trade of the species depends upon

- Collected amount for selling
- Method of drying and dryness of the material
- Purity of the species
- Condition of collected species (smell, taste, rotten, semi-rotten, slightly rotten, good etc.)
- Intactness of the collected material after drying (Cap and Stipe)
- Center for collection/trade
- Nearness of the market
- Availability of the purchaser
- Interest of the collector, seller and buyer
- Type of packaging material

After the tertiary trader the value become more high. The steps of trade are given below:

Morel		
Step I	Primary value (Collector)	
Step II	Secondary value (local trader) I	Local mrket value
Step III	Tertiary value (main buyer) II	
Step IV	Value addition Market	Export value

Critical natural condition necessary for the growth of morels

A concept has been developed to analyse the probable condition necessary for the appearance and growth of morels in natural condition. It is based from the previous and present production, trade and or climatological data of the area. Therefore, it is assumed that the production of morel depends on :

- westerly rain and snow in the months of January, February and March. The snowing should be above 2700m altitude in alternate weeks followed with sporadic rain pouring down to the basin for the whole month of February till the second week of March and April.
- the temperature should remain in between - 4^o (minimum) and 16 - 20^o C (maximum) for the whole month of February. In March the temperature should remain between -1^o (minimum) and 16 -24^o C (maximum) for the whole month. The month of April should have sporadic rain with cool pleasant weather.

Suggestions

- The area should be explored and surveyed intensively during March April and August to find out the productivity.
- The price should be raised according the labour cost involved during collection.
- Train people involved in collecting the morel as to avoide harvesting small morel.
- Hand over forests to community to safeguard production.
- Sell morels by auction.
- Avoid distrubing natural forests.

- Do not burn the forest and avoid disturbances to mycorrhizal associations.
- Small scale industrial establishment of modern drying technology and canning process for fresh morels.

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