

## Yarsagumba [*Cordyceps sinensis* (Berk.) Sacc.]; Traditional Utilization in Dolpa District, Western Nepal

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Received: 28.11.2006; Accepted: 20.12.2006

### Abstract

*Cordyceps sinensis* (Berk.) Sacc., a well-known and valued traditional medicine, is also called winter worm summer grass. The product deserves high potential to generate income opportunities, enhance rural income and raise the national revenue. The study of *C. sinensis* was carried out in Dolpa district, Western Nepal to document ethnomycological uses and local practices. Data were collected using open ended questionnaires administered to collectors/users (n = 74), traders (n = 25) and local healers or *amchis* (n = 3). Indigenous peoples are utilizing this Himalayan treasure for the treatment of different diseases like diarrhea, headache, cough, rheumatism, liver disease, and also as an aphrodisiac and tonic. Internationally it is regarded as Himalayan Viagra. The present study therefore aims at highlighting the ethnomycological uses of *C. sinensis* resource of the Trans-Himalayan region in their niche.

*Key words:* *Cordyceps*, Dolpa, Ethnomycology, Nepal

### Introduction

The British mycologist Berkely first described it in 1843 as *Sphaeria sinensis* Berk. Later in 1878, Saccardo renamed it as *Cordyceps sinensis*. The scientific name *Cordyceps sinensis* (Berk) Sacc. is referred to the final form, which is the fruiting body of the fungus arising out of the dead body of a caterpillar. There are more than 350 types of so called *Cordyceps* or its substitutes in terms of their medicinal values have been found worldwide today, such as *Cordyceps militaris* (L.) Link (the most commonly used substitute), *C. martialis* Speg., *C. hawkesii* Gray, *C. liangshanensis* Zang, Liu et Hu, sp. nov., *C. barnesii* Thwaites, *C. cicadicola*, *C. gracilis* (Grav.) Dur. et Mont., *C. ramose* Teng, *C. ophioglossoides* (Ehrh. Fr) Link and *C. gunnii* (Berk.) Berk etc. Thus, it is a serious problem

for authentication and quality control of *Cordyceps* on the market (Hsu *et al.*, 2002; Li *et al.*, 2006). From Nepal three species of *Cordyceps* namely *C. sinensis* (Balfour – Browne, 1955), *C. nutans* (Shrestha, 1985) and *C. nepalensis* (Zang and Kinjo, 1998) are reported to date. Among them only *C. sinensis* is used for medicinal values.

*Cordyceps* was discovered about 1500 years ago in Tibet by herdsmen who observed that their livestock became energetic after eating a certain mushroom. About 1000 years later, the Emperor's physicians in the Ming Dynasty learned about this Tibetan wonder and used this knowledge with their own wisdom to develop powerful and potent medicine. Initial records of *Cordyceps* as medicine date from

the Qing Dynasty in China in 1757 (Sharma, 2004). Its current high international profile and demand developed only sometime in 1993 when many Chinese long distance runners broke world records. There was the initial suspicion of the use of performance-enhancing drugs but this was unfounded. The Chinese instead boasted of taking *Cordyceps*, and it was then 'presented in the popular press as a 'wonder herbal', and the last ten years has seen an increase in its market' (Zhu *et al.*, 1998). Recent research has revealed that *Cordyceps* usage increases both the cellular ATP (adenosine tri-phosphate) level (Namgyel and Tshitila, 2003) and oxygen utilization (Zhu, 2004).

There has been extensive research undertaken on all aspects of the species, particularly identifying, isolating and culturing active compounds, and running clinical tests (Zhu *et al.*, 1998). *C. sinensis* is consumed mixed with rice flour in boiled milk. Traditionally, it has been consumed with a variety of meats of chicken, duck and pork (depending on type of ailments) in the form of a medicinal soup (Zhu *et al.*, 1998; Winkler, 2004).

Local knowledge is interrelated with perceptions of many aspects of natural environment such as soil, climate, vegetation type, stages of ecological succession, and land use (Martin 1993, 1995). In some parts of Nepal, *C. sinensis* is powdered and combined with the rhizome of *Dactylorhiza hatagirea* for consumption (Adhikari, 2000). It is also used as tonic for yak and sheep. A combination is made with *D. hatagirea* (D. Don), honey and cow's milk for tonic and aphrodisiac (Lama *et al.*, 2001). It is widely used as a tonic and aphrodisiac in Thak areas, Mustang. It is taken as a whole orally in combination with honey and cow's milk. (KC and Satyaal, 2006).

Internationally, the health efficacies of *Cordyceps sinensis* are observed and tested in asthma, allergic rhinitis, poor renal function, renal injuries by chemicals chronic bronchitis, coughing, poor resistance of respiratory tract, regulating blood pressure (high or low blood pressure), anti-aging, weakness, the declining of sex drive, lowering raised blood lipid levels, strengthening the body's immunity, poor function of lungs and kidneys and in irregular menstruation (Zhu *et al.*, 1998; Halpern, 1999; Mizuno, 1999; Francia *et al.*, 1999).

In this study an effort has been made to document the ethnomycological knowledge associated with the locals about *Cordyceps* using patterns and benefits.

#### **Materials and methods**

Dolpa has one of the largest stores of high altitude Himalayan medicinal and aromatic plants in Nepal and also a vast body of knowledge related to the management and use of medicinal plants, exemplified by the presence of more than 50 or so *amchis* (Tibetan medical doctor) in particular who are actively involved in providing health care services to the local communities (Lama and Thomas, 2002). Different localities and settlements of Lower Dolpa were surveyed in May-July, 2006. Main settlements from where information was collected comprise Raha VDC, Majphal VDC, Tripurakot VDC and District Headquarter Dunei. Along with these, collection pastures like Palma Ramana pasture of Raha VDC and Pokeypani and Saiquarry pastures of Majphal VDC were visited and questionnaires were made with the collectors of 15 western districts in the collection sites with their oral consents. The open-ended questionnaire was administered

to respondents individually as a semi-structured interview (Kvale, 1996). Mainly the respondents were collectors (n = 74), traders (n = 25), healers (*amchis*) and local practitioners (n = 3). They were consulted for their local names, traditional and commercial utilization, their parts used modes of preparation of medicines, disease treated and methods of their administration. Information was cross checked at different places with other respondents.

### Results and discussion

People in Dolpa call the high value medicinal herb *Cordyceps sinensis* as *Yarsagumba*, *Jara* (Root), *Kira* (Insect), *Jeevan buti* (Life tonic) *Chyau* (Mushrooms), and *Chyau Kira* (mushroom insect) etc. Dolpa district has been a famous ground of *C. sinensis* in the country since long time. Local respondents in Dolpa have reported that collection of *C. sinensis* started from 2044 BS (1987 AD). Before that common people did not have knowledge about its uses.

According to respondents, local herders in the early years were the pioneers for their explorations. Formerly, they used to collect only the aerial part (fruiting body/ stroma) of *C. sinensis* and collected in the doko (indigenous bamboo basket). They used to dry the product in the sunlight as primary processing. Local people believe that it gives good strength and hence they used to give it as gift to relatives and friends.

People in Dolpa mostly involve themselves in agricultural activities; but in the season of *Cordyceps sinensis* collection they keep all other activities in secondary priority and actively involve in *C. sinensis* collection they earn money for their livelihood support. Local people, mostly indigenous communities, collect medicinal plants for trade and household consumption, for medicinal

purpose. Traditional healers use different medicinal plants to cure different types of diseases. Local informants have said that barely 25% of total population including weak children, women and old people live in villages during the collection season of *C. sinensis*.

Different beliefs are expressed locally while directly seeing the live and fresh larvae that are actually the host of *Cordyceps sinensis*. Some collectors cover the larvae with some soil mass thinking that it will give birth to *C. sinensis* in the next year. Some believe that seeing the live caterpillar in the beginning of collection is good luck for prosperous life. Thus, they are conserving the caterpillar; but some collectors also consume the caterpillar after roasting (in fresh conditions) and believe it to cure joint aches.

Local and outside collectors in Dolpa district are aware of the uses of *Cordyceps sinensis*. They are using *C. sinensis* since last 20 years. Normally they used it as tonic and sexual stimulant for both sexes. Other local uses of *C. sinensis* are in diarrhea, headache, cough, rheumatism and liver disease. People have their own knowledge for the use of *C. sinensis* in different diseases. Different doses of *C. sinensis* are used by its quality and also depending on the seriousness of the disease. As a tonic and for the purpose of sexual stimulant, people of both sexes normally use a daily combined dose of one dried *C. sinensis* with half liter of milk and two teaspoons of ghee for a week. Sometimes only a *C. sinensis* with a cup of milk is also used. Local users believed that if this practice is continue until recovery, every disease could be cure.

In another practice, one piece of *C. sinensis* is put in one cup of local home made alcohol and left for half hour and drunk in the morning or evening as a tonic. Hot water could be used instead of alcohol.

Rich traders and shopkeepers of Dunei and

Juphal area in Dolpa keep 5-6 pieces of powdered *Cordyceps sinensis* and a piece of dried musk (approx 0.5 g) in alcohol (1000 ml) for six months. After six months they drink the product as normal alcohol. They have expressed that such preparations are highly tasteful and good as sexual stimulant and tonic.

Regarding the stage of *Cordyceps sinensis*, young or immature ones (thick and golden larvae with short and light brown aerial fungal part) are good for taste and their values than matured one (with long and dark brown fungal part and light in weight). According to their view main part of *Cordyceps* is caterpillar part but not an aerial fungal part. This finding conform the observations made by Winkler (2004).

Though *Cordyceps sinensis* play significant part in their livelihood, a number of threats are annually posed to the biodiversity of producing pastures in Dolpa and these threats are mainly of anthropogenic nature. The major threats are due to excessive grazing of animals, haphazard collection, over trampling effects, high use of fuel woods, intentional fires with the purpose of getting fuel wood, obtaining better regeneration of *C. sinensis* and securing better grass production for their cattle (in transhumance lifestyle) in the next season. Everything possible needs to be done to ensure that a healthy environment is sustained and sustainable harvesting is carried out, so that medicinal fungi and plants will be able to provide a basic income to rural households and healing for generations to come.

### Conclusion

Plant remedies, although based on natural products, are not found in 'nature' per se, but are the products of human ethnobotanical knowledge. Indigenous technical knowledge in this respect has to be carefully abstracted,

and the design of effective conservation strategies must therefore include safeguarding the plant genetic resources as well as indigenous knowledge and techniques which can conserve the biodiversity and improve the well being of mankind. The importance of protecting the indigenous and local knowledge is being recognized in national and international fore. People in Dolpa normally consider *C. sinensis* as tonic and sexual stimulant. Maintaining the tenure of pasture and conserving the biological niche for the sustainable production and management of this Himalayan treasure are present needs and all the concerned bodies should be responsible for these issues. Therefore, the overall knowledge on the natural distribution, abundance, population structure, dynamics of a species and ethnomycological knowledge are crucial.

### Acknowledgements

I would like to dedicate this work to Late Dr. Damodar P. Parajuli, Late Dr. Chandra P. Gurung and Late Mrs. Yeshi C. Lama who rest in the lap of nature. They had provided me tremendous support in every steps of work in the forms of financially, technically and morally inputs. In the mean time I am grateful to WWF Nepal Program and SAFE Concern for necessary arrangements. I am indebted to the many harvesters, traders, local healers and local practitioners, who took time to participate in the study. Help obtained from Rabin Shahi, Janak Ukheda, Ram K. Deo, Anil Shrestha, Kamal Acharya, Morten Christensen, Maan B. Rokaya and Mani R. Shrestha is invaluable and I am highly indebted to them all. I am thankful to an anonymous referee for valuable comments and suggestions on earlier versions of the manuscript.

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