

## **Discovering *Cordyceps sinensis* in Ayurveda**

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### **Abstract**

*Cordyceps sinensis*, locally known as *Yarsagumba* in Nepali is found in alpine meadows of Himalaya above 3600m from the sea level. *Yarsagumba* develops when a type of fungus parasites the larvae of a moth and forms a fungus composite body. The larva forms a cocoon in the winter and hibernates in the ground. Because the fruiting body of the fungus emerges from the head of the larva in the summer trembling a grass sprout, it's local name means roughly *Yarsa*(winter bug) and *gumba*(summer grass). This plant is mainly used to treat low energy following serious illness and as a strengthening tonic. It resembles all the properties of *Rasayana* and *Vajikarana dravyas* mentioned in Ayurveda. Its medicinal value is rooted in Tibetan indigenous medicine and at present is traded for approximately around \$25000 per kg. Though Himalaya has always been the best place for qualitative herbs, there is not any clear proof of the ancient Ayurvedic literatures mentioning about it. However, one cannot deny the possibility of this drug being used in past with name other than it possesses today. Though it needs a lot of research and authenticity, this paper attempts to provide an Ayurvedic lens to this unique and important natural gift.

### **Keywords:**

*Yarsagumba*, *Rasayana*, *Vajikarana dravya*, *Yarsagumba* collection

### **Introduction**

Botanical name: *Cordyceps sinensis*(Brek.) Sacc.

Family: Hypocreaceae

### **Vernaculars:**

Nepali: *Yarsagumba*, *Jeebanbuti*, *Sanjivani*,  
*Kiraghans*

Tibetan: *Yarchakunbu*

Chinese: *Dong chong xia cao*

Japanese: *Tochukaso*



### **Description of name:**

In Tibetan, it is called *Yarchakunbu*, which literally means ‘Yar’ for rain; ‘Cha’ for plant; ‘Kun’ for winter; and ‘Bu’ for insect. Hence, the literal meaning of *Yarchakunbu* becomes summer plant winter insect.

Tibetan people consider it as a ‘Bu’, which means living insect. In Buddhism, the collection of ‘Bu’ is considered as a sin act, which may be the reason of *Yarsagumba* being protected in the Himalayas for thousands of years.

The botanical name of *Yarsagumba* comes from a latin word ‘Cord’and ‘Ceps’ which mean club and head respectively. So, the meaning derived from its Latin name is an insect with its head in a horse’s tail like body (NEHHPA 2006).

### **Biological Description of *Cordyceps sinensis*:**

#### **Habit and habitat:**

*Cordyceps sinensis* is an insect parasitizing fungus of the *Hypocreaceae* family, found at alpine meadows above 3600 m from the sea level. This fungus lives primarily in the larvae of one particular species of moth, *Hepialus armoricanus*. It is found that this larva is a voracious

eater of leaves of plant *Bistorta macrophylla*. It is occasionally found growing on other moth species as well.

### **Morphology:**

It is 5-15 cm long and 0.14 to 0.4 cm thick and resembles a caterpillar in shape and colour. It has a black or brown stem about 2-5cm long. Based on colour, it has 2 types. The whitish yellow is larger and good in quality. The other type is of copper colour and is smaller as well as qualitatively compromised.

There are 310 types of fungus of this genus but three of them are found to have medicinal value. Among these three, the *Cordyceps sinensis* is found to have the best quality.

Two other species of *Cordyceps* that are used as medicines are *Cordyceps militaris* and *Cordyceps barnesii*, found in Korea.

### **Historical Background of *Cordyceps sinensis*:**

*Cordyceps sinensis*, known to the Chinese as “DongChongXiaCao” and to the Japanese as “Tochukaso” has been used in medicine for a very long time. The first known written record of this herbal medicine was in the Ben-Cao-Cong-Xin (New Compilation of Materia Medica) by the author Wu-Yiluo. Written around the year 1757 AD during the Qing Dynasty, this early medical text lists the traditional usage of *Cordyceps* as a “Lung Protectorate”, for “Kidney Improvement” and as a “Yin/Yang double invigorant”. (Holliday et al.)

However, in Ayurveda there isn't any documented proof of this product being used as the same name. But it is believed that the ‘Sanjivani’ brought by Hanumaana from the Himalayas in Ramayana is the same plant which was used for Lakshmana.

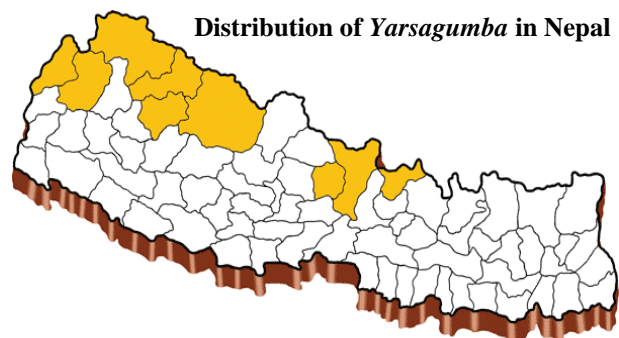
During the 13<sup>th</sup> century, Ming Dynasty from China popularized the use of *Yarsagumba* collected from the Himalayan belt, most probably Nepal. They used to give a big surprise award to those who used to take pains to bring *Yarsagumba* from Nepal (Rawal). The vegetable worm first became widely publicized during the 1994 Asian Games in Hiroshima, when two female Chinese athletes, Wang Junxia and Qu Yunxia, attributed their display of phenomenal power and beat the world records for 1,500, 3000 and 10,000 meters. Later it was learned that they used it at the recommendation of their coach, which has been known for 2,000 years as a folk medicine that gives immense power and lengthen life (Rawal and Wikipedia).

### **Nepal and *Yarsagumba*:**

Located at central part of the great Himalayan range, Nepal provides habitat to wider varieties of flora and fauna. These floras contain many west Himalayan elements and that of east Himalaya too, with many Sino-Japanese elements. Northern part of Nepal provides habitat to the plants of the Tibetan plateau, especially in the trans-Himalayan regions (Bhattra N. 1989-1993). Over 1,000 species of Himalayan plants have been discovered and described from the Nepalese Flora

(Bajracharya et al., 1988). Some 370 plant species are endemic to Nepal (Joshi and Joshi, 1991) of which 252 are found in high altitude (Bajracharya et al., 1988). Amongst these *Cordyceps sinensis* has received higher attention these days. In Nepal Polunin and Williams first collected it in 1952 from Chakure Lek of Jumla district (NEPHA 2006).

Dolpa district is one of the major areas producing *Yarsagumba* in Nepal. Besides, it is also



found in many other places like Darchula, Humla, Lamjung, Bajura, Bajhang, Mugu, Jumla, Gorkha and Rasuwa (Gyawali 2006). In recent years, some other high altitude regions of Nepal also have been found to have contained this unique herb.

### Collection:

This product is collected during the spring and early summer when the snow melts and fungus sprouts out on the hills (Gyawali 2006). Crowd of thousand of local people gather in Nepal Himalaya's alpine meadows in the season.



### Cultivation of *Cordyceps sinensis*:

Since native *Cordyceps* (wild *Cordyceps sinensis*) is rare and very expensive, countries like China and Korea have been investing a great effort in research for cultivation of this fungus. However, the exact method of cultivation of this fungus has not still known in Nepal. Some individuals and business organization are working on in this aspect. In 1982, Institute of Materia Medica, Chinese Academy of Medical Sciences isolated commercial strains of *Cordyceps* for the first time. This strain named CS-4 was fermented in aseptic environment to



develop a mycelium, which underwent extensive human testing, and clinical trials during the 1980's. Commercial production of Yarsagumba began from China in the name of *JinShuiBao* capsules. A wide range of population was encouraged to use it as a clinical trial in order to establish its chemical composition, therapeutic activity, toxicity and many other facts. (Bau, 1995)

### Rasayana in Ayurveda:

Acharya Dalhana says

*Bhesajashritaanam rasaviryavipaakaprabhavaparamaayurbalaviryanaamaya sthyairyakaranaamayanaam laabhaopaayo rasaayanam.*

Su. Su. 1/15

Those dravyas, which are capable of utilizing all the rasas, gunas, virya, vipaak and prabhava to strengthen the body and develop immune mechanism increasing the lifespan, are known as Rasayana. Rasayanas increase a healthy person's mental and physical capabilities.

Rasayanas or vitalizers replenish the vital fluids of our body, thus keeping us away from diseases. Rasayana is actually that which increases the essence of each dhatu, starting with rasa. Literally, Rasayana is a sanskrit word comprising of Rasa & Ayana.

Rasa means the nutrient portion derived after the proper digestion of the food and Ayana means proper chanalisation of such nutrients. Hence Rasayana therapy provides good nutrition to different tissues of our body and maintains health leading to long healthy lifespan. It can be effectively used in treating geriatric disorder as they are also known as vayasthapak. Various merits of Rasayana therapy have been highlighted in the texts of Ayurveda like Charaka in the following sloka

*Dirghamaayu smritimedhamaarogyam tarunamaya.*

*Prabha warna swaraudaaryam dehendriyam balam param.*

*Waaksiddhimpranatikantilavate na rasayaanat.*

*Labho paayo hi sastaanaam rasaadinaam rasayanam.*

Ch. Chi. 1/8

Dirghamaayu (Long life)

Smritimedha power (Increase in memory)

Arogya (Good health)

Tarunamaya. (Young looks)

Prabha varna. (Glowing skin)  
Sworaudaaryam. (Modulated voice)

Dehendriya balam param (Optimum strength  
of the body and organs)

However the Rasayana dravyas are considered useful as remedies of various ailments especially the Auto-immune conditions and other psychosomatic disorders.

It is also said as:

*Rasayanancha tadjgeyam yajjaravyadhinaashanam. Ch. Chi. 1/5*

Hence, Rasayanas deal with the methods to maintain youth, increase longevity, intellectual capacity and strength and keep the patients free from diseases.

## Vajikarana in Ayurveda:

### Definition:

Vaaja is the word synonymus to Vega of Sukra (semen). Person with vaaja is called Vaaji and lacking it is called Avaaji. So, vajikarana is the process of changing an avajji purush to a vaaji purush. As per some definitions those dravyas which enables a male to enjoy sex for a longer time are known as vajikarana dravya. .

Vajikarana is defined as

*Yena naarisusamarthyam vaajiballavate nara.  
Brajechhavyadikam yena vaajikaranameva tatt.  
Ch. Chi. 2/4/51*

Vaajikarana in Ayurveda explains the art of producing healthy progeny for the creation of a better society.

Vajikarana therapy is recommended to treat various diseases like infertility and conditions relating to weak shukra dhatu resulting in male impotence (napunsakata). Ayurveda has laid much importance on a male's potency. Charaka states the use of aphrodisiacs as mentioned in ayurvedic therapies (Vajikarana therapies) enhances one's potency. These medicines are said to give one the strength and potency of a horse by increasing the quantity and quality of semen. It helps increase the will power, intellect and memory in addition to a healthy body. As shukra dhatu is the final product of all the dhatus and a precursor of Oja, the immunity of the body, also known as the eighth dhatu. Hence, vajikarana dravyas help people to renew the sukra dhatu ultimately strengthening the immune system. For this purpose various aphrodisiacs and tonic preparations are prescribed for enhancing the vigor and reproductive capabilities of men. These not only serve as sukrabardhak(precursor of sukra) but also strengthen other body tissues (dhatus) like muscles, fats, bones and blood. They are said to increase quantity and quality of semen, sperm count and sperm motility and nourishing the body of the person.

### Chemical composition of *Cordyceps sinensis*

S.N.	Component	Unit
1.	Water	10.84%
2.	Fat	8.4%
3.	Coarse protein	25.32%
4.	Coarse fiber	18.53%
5.	Carbohydrate	28.9%

Source : Tang Teng-han et al



### Important components of *Cordyceps sinensis*

S.N.	Component	Unit	Value
1.	D-mannitol	Mg/g	76.81
2.	Polysaccharide	%	11.2
3.	Protein	%	25.44
4.	Vitamin A	Mg/g	0.315
5.	Vitamin pp	Mg/g	0.032
6.	Vitamin B12	Mg/g	0.02
7.	Serien	Ppm/g	0.14
8.	Zinc	Ppm/g	13.9
9.	Copper	Ppm/g	2.8

Source: China Science Institute Shimyang Edible Center

### **Medicinal value of *Cordyceps sinensis*:**

Traditional Chinese Medicine (TCM) suggests use of *Cordyceps sinensis* by cooking the whole fruit body in chicken or duck soup. People use it this way for the treatment of many conditions, such as respiratory diseases, renal dysfunction, hyperlipidemia and hyperglycemia. (Zhou, Halpern and Jones, 1998). Clinical research has shown '*Yarsagumba*' to be very effective in treatment of Arrhythmia, Chronic kidney failures and hypercholesteraemia. It helps to strengthen the immune system of patients receiving chemotherapy, Anti tubercular drugs and various surgeries. The Host Defence Potentiators (HDP) present in *Yarsagumba* defends the host (patient) from foreign invasion by bacteria, cancer cells, and virus and thereby boosts the immunity. It also stimulates the hormone production giving it an anti-aging property (Rawal).

It's mode of use varies from place to place.

In Nepal *Yarsagumba* is believed to act as an aphrodisiac and as a tonic when 1-3 pieces are taken regularly mixed with either milk or Shilajatu.

Balfour-Browne (1955) mentioned that Bhutanese use it for impotence caused by typhoid and other permanent diseases (Rawal).

Chinese believe that it boosts Yang, strengthens kidneys, reduces phlegm, and stops bleeding (Holliday et al.).

Researches show that it may be useful in the treatment of cardiac arrhythmia, angina pectoris, liver disease, and even cancer. It is a building block for gene repair in cell replication and plays an important role in ATP, AMP (energy) metabolism. There are a number of components like deoxy-nucleosides produced by *Cordyceps sinensis*, such as the compounds 2',3' deoxyadenosine which is marketed in the United States as a drug for the treatment of AIDS under the trade name "Didanosine" (Holliday et al.). Similarly Quinic acid derived from Cordycepin present in *Cordyceps* is found to have anti viral and antibacterial property (NEPHA 2006).

Including Holiday et al, many literatures have been found to be describing *Yarsagumba* for following uses.

#### **Hrididya (Cardiac Tonic)**

It has been found to have good effects in various Hridaya rogas (Cardiac diseases). Studies have shown that over 84% of the patients with Hridaya roga esp. cardiac arrhythmia improved following treatment with *Yarsagumba*.

#### **Raktasodhak (Blood purifier)**

*Yarsagumba* reduces the amount of LDL Cholesterol and increases the amount of HDL Cholesterol thus thereby works as a blood purifier. It is found to have lowered total cholesterol levels by over 17% in a clinical trial.

#### **Yakrit Balya (Liver Tonic)**

*Yarsagumba* is found capable of curing some liver diseases. Clinical trials have shown that treatment with *Yarsagumba* improved symptoms of liver cirrhosis following hepatitis. The extract of *Yarsagumba* is considered to relax contractions in the liver blood vessel system and to increase hepatic blood flow, causing liver ATP levels to increase. Such hepatic ATP augmentation may contribute to the acceleration of recovery and improvement of liver function in patients with anaemia. (Manabe et al. 1999)

#### **Balakarak (Strengthening tonic)**



Cordyceps Sinensis is an excellent strengthening tonic for convalescing patients, and patients with reduced appetite, weak blood, weakened resistance of respiratory tract and susceptibility to colds or flu can take this product orally to strengthen resistance. Cordyceps has an ancient reputation as an effective sex stimulant for male. At present day, this property has made it so expensive and important. It has been termed as ‘Himalayan Viagra’ or ‘Herbal viagra’ by the western world nowadays.

#### **Used in Vrikka roga (Kidney Diseases)**

In TCM *Yarsagumba*'s main use is in the treatment of Kidney disorders. It is believed that it improves kidney function. In kidney transplanted patients it was shown to return levels of infection fighting T cells to normal.

#### **Used in Swas roga (Respiratory Disorders)**

A preliminary study found that middle aged and elderly patients who took *Cordyceps* for COPD showed notable improvements. During its intake by the patients with respiratory disorders it has found to improve coughing, reduction in quantity of sputum, and gradual decrease in shortness of breath. It has also good results in curing prolonged chronic bronchitis (both asthmatic and ordinary type), particularly ordinary type.

#### **Ojobardhak (Immunomodulator)**

*Yarsagumba* appears to be one of the most adaptive immune modulators. The mushroom was found to quiet immune cells in patient with abnormally overactive immune systems, and to raise immune system functions in patients with low or compromised immunological activity. These include a cure for tuberculosis and a restorative action after various diseases (Chatterjee et al. 1957).

#### **Adverse effects:**

Breathing problems or tightness in throat or chest, chest pain, skin hives, rashes, itchy or swollen skin are some of the rare side effects, this herb may attribute to. However, studies have suggested two major side effects in some cases viz. low blood sugar (hypoglycemia) and stomach upset (Halpern GM et. al 1998).

#### **Economic value:**

From Nepal, *Yarsagumba* is mostly illegally traded to China or Tibet in bulk quantity of 3-5 tons per year worth NRs. 1-1.5 billion. Its price varies approximately around NRs 25,00,000 per kg in Nepal. In 2004, only two villages (Majhphal and Sun) of Dolpa district in Nepal sold around 600kg of *Yarsagumba*, most to Tibet. It is estimated that 1 kg of *Yarsagumba* contains 2,700-4,500 pieces. Government's rate of royalty is NRs. 10,000 per kg. Local people of Himalaya are much dependent on this resource, more economically than medicinally.

#### **Conclusion**

The Ayurvedic medicine is rich in natural herbs and the rejuvenator group of herbs termed as “Rasayana” has micronutrients, which improve health, immunity, vigor, vitality, and give longevity as well as protection against stress. All these actions of certain Rasayana dravyas have now been scientifically proved through experimental as well as clinical studies. Rasayana dravyas prevent the process of aging and keep the individual free from disease even at an advanced age. In this context, we need to introduce a new Rasayana dravya, *Yarsagumba*, in Ayurveda. Like all the other Rasayana formulations eg. Chyavanaprasha, Triphala rasayana, Pippali rasayana, Shilajatu, Haritaki rasayana, etc. *Yarsagumba* Rasayana

is too serving the people in many aspects. In addition to enriching Ayurveda with a new ingredient, local economy will be improved ensuring sustainable incomes to poor peoples of Himalayas. Thus, it becomes the responsibility of entire Ayurveda world to encourage its use and help people lead a healthier and happier life without itself being destroyed.

## References:

- Bajracharya, D.M., Joshi, R.M., Rajbhandari, K.R., Shakya, P.R. & Shrestha, T.B. 1988: *Endemism in Nepal flora. In: Proceedings of the National Conference on Science and Technology*. Royal Nepal Academy of Science and Technology. pp. 73-76
- Balfour-Browne (1955): Citation made from unpublished article “*Nepal’s Pride Yarsagumba*” by Dr. Rana B. Rawal
- Bau TT, 1995. Further Study of Pharmacological Functions of JinShuiBao. *Journal of Traditional Chinese Med* 1995;5 (suupl):6
- Bhattra N. 1989-1993: Article on *Regional Aspects of Medicinal Plants Use, Biodiversity - People Interface in Nepal*
- Charak. Charak Samhita Commented by Pandit Kashi Nath Shastri and Dr. Gorakha Nath Chaturvedi. Varanasi: Chaukhamba Bharati Academy; 2007
- China Science Institute Shimyang Edible Center: Citation made from unpublished article “*Nepal’s Pride Yarsagumba*” by Dr. Rana B. Rawal
- Gyawali 2006: Article titled “*Himali Money – Yarsagumba*”, Himal Magazine, Issue 174, July 2006
- Halpern GM, Zhu JS, & Jones K: The scientific rediscovery of a precious ancient chinese herbal regime: *Cordyceps sinensis*, part II. *J Alt Complement Med* 1998; 4(4):429-457.
- John C. Holliday, Phillip Cleaver, Megan Loomis, Dinesh Patel: The hybridization of *Cordyceps sinensis* strains and the modifications of their culture parameters, in order to optimize the production of target medicinal compounds
- NEPHA 2006: Extension Material Series, Nepal Herbs and Herbal Products Association
- N. Manabe<sup>1</sup>, Y. Azuma<sup>1</sup>, M. Sugimoto<sup>1</sup>, K. Uchio<sup>1</sup>, M. Miyamoto<sup>1</sup>, N. Taketomo, H. Tsuchita & H. Miyamoto<sup>1</sup> 1999 : Effects of the mycelial extract of cultured *Cordyceps sinensis* on in vivo hepatic energy metabolism and blood flow in dietary hypoferric anaemic mice
- Sushruta. Sushruta Sahmita commented by Ambika Dutta Shastri. Varanasi: Chaukhamba Sanskrit Sansthan; 2007
- Tang Teng-han et al: Citation made from unpublished article “*Nepal’s Pride Yarsagumba*” by Dr. Rana B. Rawal
- Zhou, Halpern and Jones, 1998 Zhu JS, Halpern GM & Jones K: The scientific rediscovery of a precious ancient chinese herbal regime: *Cordyceps sinensis*, part I. *J Alt Complement Med* 1998; 4(3): 289-303



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