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Caterpillar Fungus of the Tibetan Plateau

By Lucas Crouch

Introduction

Chongcao is a traditional Chinese medicine that can only be found on the Tibetan plateau. It is the result of a parasitic relationship between the Ghost moth Larva and the fungus *Cordyceps Sinensis*. Chongcao is highly prized among the Chinese as a medicine and the value is reflected in the market. The price of Chongcao increased by 900% between the years 1997 and 2008 (Winkler, 2010). In 2009 the market went down a slightly due to the 2008 financial crises but the price in 2010 recovered to 2008 levels. It is currently worth twice its weight in gold. (LA Times) Chongcao appears in other Asian markets such as Korea and Japan but not nearly to the extent that it does in the Chinese market. The annual production for the entire Tibetan Plateau is estimated at 135,000kg. (Winkler, 2010) This unique demand has resulted in an economy centered on the harvest and sale of Chongcao which has changed the lifestyle of Tibetan communities.

Etymology

Chongcao can be called by a few different names. The full Chinese name is *dong chong xia cao* (冬虫夏草) which can be translated into English as winter worm summer grass. This is most likely derived from the Tibetan name *yartsa gunbu* (ཡར་མཚན་གུང་བུ་) which can be literally translated as summer herb, winter worm. I noticed that in Tibetan it is sometimes simply referred to as *bu*, meaning worm.

The proper scientific classification for Chongcao is *Ophiocordyceps Sinensis*. In 2007, recent scientific data placed what was previously called *Cordyceps Sinensis* into the family *Ophiocordyceps Sinensis*. The name *Cordyceps* in Latin means club head and *Sinensis* means from China. In this paper I will refer to the fungus aspect of the organism as *Cordyceps Sinensis*

and I will refer to the TCM medicine harvested on the Tibetan Plateau as Chongcao, but I will sometimes just call it caterpillar fungus.

Biology

Cordyceps is a genus of endoparasitic fungus that mostly infects insects and other arthropods, yet there are varieties which parasitize other funguses. When the Cordyceps fungus attacks an insect their myceliums spread and eventually replace the tissue of the host substrate. During this process some Cordyceps strains are able to influence the behavior of their host organism. Cordyceps Unilateralis is a species of the genus that attacks ants. After infection it influences them to climb to a high stem of a plant and secure its position by clamping down with its mandibles. Once in this position the ant dies and a mushroom emerges from its head. Eventually spores are released which carry in the wind and spread to infect other ants in the same manner. This species lives in tropical forest environments. Another species, Cordyceps Militaris is similar to Chongcao in that it infects the bodies of moth larvae in Northern Ireland. Both of these species have supposed health benefits like Cordyceps Sinensis but extensive research has not been pursued yet.

Cordyceps Sinensis is similar to these other species. It parasitizes the *Thitarodes* ghost moth larva which is endemic to the Tibetan plateau region. The title of this paper is actually a misnomer. While Chongcao is commonly referred to as caterpillar fungus in English, it is technically a larva. Caterpillars have hair, larva do not. The Ghost Moth larvae live underground and feed on the roots of grass. It is still unclear how and when Cordyceps Sinensis infects the larvae, but once infected the larvae is brought to burrow at a shallower depth than it naturally would for the winter. During the winter months the Cordyceps fungus continues to grow inside its host. When the snow melts and spring comes around a mushroom sprouts from the head of the

caterpillar and emerges from the ground. After the mushroom is fully developed it will start to release spores which carry through the air to infect more caterpillars and continue the life cycle. Without being infected the life cycle of the ghost moth caterpillar is lived as a larva for 5 years then it pupates and lives as a moth. It only lives as a moth for 2-5 days; it must reproduce and continue the life cycle during this time before it dies.

There are over 30 different species of *Thitarodes* ghost moth but only 25 of these play host to *Cordyceps Sinensis*. (Winkler, 2010) This allows for a variety of different Chongcao when collected. During my research I didn't encounter much of a variety but I was limited to the area around Litang and Shangri-La so it is very possible that these other varieties are common to other parts of the Tibetan plateau. The caterpillars that I encountered in my research were dark and brownish in body color. There is also a variety of larvae which is a tan color. Chongcao collected in Nepal, Bhutan, India and some Himalayan habitats has large red eyes which makes it distinct from other caterpillars. These caterpillars are actually seen as inferior in healing capability and sell for about 10-20% less than the least expensive of better varieties. (Winkler, 2010) The length of the mushroom varies and depends on the time of harvest. The longer mushrooms have been picked later and have caused the caterpillar to lose rigidity and nutrients.

History

The first mention of Chongcao comes from the Tang Dynasty (AD 618–AD 907). They described it as a creature which transformed to a plant in the summer then back to an animal in the winter. (Holliday, 2008)

The first record of the medicinal use of *Cordyceps Sinensis* dates back to Zur mkhar mnyam nyid rdo rje (1439-75), 34 who lived during the fifteenth century AD and is renowned as the founder of Tibet's Zur medicinal tradition. (Winkler, 2008)

The first introduction to the west happened in 1726. A Jesuit priest encountered the medicinal fungus during his stay at the emperor's palace. During that time, due to its availability and rarity only members of the royal palace could afford Chongcao. He presented the mushroom to a scientific meeting in Paris. (Holliday, 2008)

Chongcao attracted the attention of the general public and the health profession in 1993 when a group of Chinese runners broke nine world records in the World Outdoor Track and Field Championships in Germany. The team was first accused of using performance enhancing drugs. The Coach eventually attributed the success to the use of a Chongcao based TCM tonic. This incident gave Chongcao worldwide publicity and certainly got some attention from the athletic community. More recently Yao Ming of the Houston Rockets came out as a fan and user of Chongcao. (LA Times)

Gongrilong

I had a great opportunity to study Chongcao in a small village named Gongrilong. A friend I had made during the semester. He happened to be the first person in his community to leave his hometown. This village was in Sichuan near Batang and I heard that they harvested Chongcao in this village. Gongrilong is a rural village in the Kham area of Tibet. When I went they had just started construction on a dirt road leading to the village. It was an 8 km motorcycle ride from the road, which is about 30 minutes from Batang. Gongrilong is actually made up of 6 different villages spread throughout the valley. The entire area consists of about 60 households.

Once I arrived I found out that the harvest of Chongcao was not just a way to make money in Gongrilong, it was their primary source of income. In fact it appeared to be the only source of income, and it might have been the only thing actually traded outside of the Village for cash. After harvest the entire village combines their harvest and sells it in Batang or Litang.

Other data on this suggests that around 50-95% of some villages income comes from the sale of Chongcao. (Winkler, 2008) The villagers in Gongrilong collected other mushrooms and harvested grains but these were for consumption and never left the community. In the Tibetan region Chongcao accounts for 95% of the mushroom economy. (Winkler, 2008) Unfortunately in Gongrilong most everyone in the village is illiterate and long term records are not kept to keep track of how much it was traded for each year.

The village has certainly changed since the price of Chongcao has picked up. It was emphasized that now they have warm clothes and they eat meat. Before they used to hunt animals and this was a source of profit for the village. Now no one hunts. The village was still very poor when I came to visit, but James told me that when he was young he did not have shoes and had to walk through the snow barefoot. The city now has electricity from hydro electric generators on the river. People own TVs and DVD players. They get all of their water from the river which is clean enough to drink from. One of the children when I visited had been injured in a horse accident and the doctor was paid for with money made from Chongcao. A lot of people owned motorcycles as well. This is apparently been a trend for many Tibetans. Before they used horses to get from place to place and now they can ride motorcycles. Chongcao is also paying for many of the children to go to school in Batang. I was told that people in the village are happy.

Harvest and collection

Even though I visited Gongrilong in November I was still able to see the areas in which Chongcao is harvested when in harvest season. Once on the market Chongcao is broken up into two or three separate qualities. The highest quality Chongcao is the largest and is grown in the range of 4,900m - 4,500m above sea level. This climate is in grasslands above the timberline on the top of mountains. This is also a typical area for yaks to graze. These caterpillars are the

largest and also the last to sprout and mature because the areas that they grow in are the last for the snow to melt. These harvesting grounds were said to be a 3 hour walk away from the village. When my contact was young he said that his family would leave at 6 am and have lunch half way up the mountain then harvest all day and come back around sunset. Now people set up camp and live in this area for the duration of the harvesting period.

The medium quality Chongcao is harvested at the altitude of 4,400m -3,900m. These Chongcao were said to grow around the azalea bush. These are harvested in the middle of the season and are of a medium size and quality.

The poorest quality Chongcao is can be collected at the same altitude of the village, 3,400m – 3,900m. These are the smallest grade caterpillars and can be harvested at the beginning of the season.

When it is harvesting season, everyone who is able to participate in the collection does. The amount of caterpillars harvested in a day can vary greatly. Some days it can be as little as 5 caterpillars per day. He said that some people don't have the right eye to harvest it and requires good eyesight. The average is somewhere around 30 caterpillars in a day. My contact bragged that one day he was able to harvest 240 specimens in a single day. People in the village sometimes save some Chongcao for the winter because the price would fluctuate from year to year. Unlike other mushrooms, Chongcao is able to dry and stay edible for at least a year. This is why I was able to purchase mine during the winter.

Because of the increasing value of Chongcao people from the village have begun to venture to the highest and farthest areas to harvest, such as the areas where the best quality is sold above 4,500m. These areas are between this village and another one on the opposite side. This has caused violent disputes over harvesting areas and people have died in these conflicts. At

least two people I met in the village had been hit with rocks during these conflicts and lost their eyes. The fighting went on for twelve years before the Llamas of the two villages mediated a peace agreement and drew a line for harvesting rights.

When the caterpillar is first dug out of the ground it is incased in dirt. From what I hear the best way to remove this layer is with a toothbrush. Careful consideration must be taken not to damage or break the caterpillar during the harvesting process. If the caterpillar is broken a toothpick is sometimes inserted to stick it back together however a broken caterpillar is greatly devalued in price. When the caterpillar is first harvested it is larger because of water weight. From what I heard the fresh caterpillars are also sold on the market in the summer. This excess water weight can be removed if the caterpillar sits out in the sun for a day.

If a caterpillar is harvested too late they can start to deteriorate in quality. Right after the caterpillar sprouts above the surface is the best time to collect because it has used little of the caterpillar as a resource. Late in season the caterpillar can start to get soft. I had it described to me that the early caterpillars are like strong toned youth while the late caterpillars are like weak, wrinkly and soft old men. If a caterpillar is picked too early it might not have enough time to release its spores and continue the next generation. However already sporulating Cordyceps are left alone because they are relatively worthless. In the long run this may be good for the continuation of the species.

It is unclear whether the excessive harvest of Chongcao is causing problems for future generations. In Gongrilong my contact reported that there were less Chongcao harvested per person than there used to be. Similarly this has been reported in Litang; however this may be due to an increase in competition with other harvesters. Another concern is that digging up Chongcao could cause ecological problems for the fragile ecosystem. This could also eventually lead to a

decrease in harvest. Either way the dependence on Chongcao as a source of income makes the depletion of this resource a serious concern.

Market

Once harvested Chongcao is divided into 2 or 3 separate categories. This seems to be a fairly subjective process and might depend on the opinions of the shop keepers or of the dealers. Perhaps I lack the experience to be able to tell the difference between the different qualities on my own. The price is measured by weight, the largest Chongcao being sold for the most per gram and the worst quality being sold for the least per gram.

I first met with Chongcao wholesalers in Shangri-la. These guys set up shop in front of a supermarket in Shangri-la; to the passive observer they would not seem conspicuous. They are just a few Tibetan guys sitting out on the steps next to the supermarket. They do this every day, from morning until afternoon. Each was equipped with a large duffle bag full of 10 kg of Chongcao. They were selling their best quality for Chongcao for 80,000 Yuen/kg and the low quality for 56,000 Yuen/kg. The guy I asked said that he had been doing this for 20 years and when he started he sold a bag of mixed quality Chongcao for 300 Yuen/kg. I asked why they didn't own shops or sell it for more and they responded by telling me that the Han were better at explaining the Chongcao properties and were better businessmen than they were. This sentiment seems to be reflected by many Tibetans.

In Lhasa, Tibet the market is controlled by large brokers who work as middle men. Chinese Muslims from Gansu dominate the Chongcao market. Tibetan brokers control less than half of the 30 tons of caterpillar fungus dealt annually there. When asked why this was, the Tibetans answered that they were unwilling to take as many risks as the Hui. (Winkler, 2010)

Language seemed to be an obvious indicator of success. Many Tibetans, especially those living in rural areas are unable to speak Chinese. Many of the Tibetans that sold Chongcao were able to speak very good Chinese. While in the Tibetan area trying to get around we got a ride from a group of young Tibetans who sold Chongcao wholesale as well. These were a very different group who also made a living selling Chongcao wholesale. This group spoke Chinese very well. They were from Litang. They sold caterpillars mainly to drugstores and businesses that make medicine from it.

The majority of the shops that I visited in Shangri-La sold other kinds of TCM remedies as well as Chongcao. With only a few exceptions Chongcao was kept behind the counter in a large bag, sometimes under lock and key. I always had to ask specifically to see it. The city of Shangri-la is roughly divided into an old town and a new town. You can find shops throughout the whole city marketing to tourists however this seems to be more concentrated in old town. Some other goods of identical appearance were marked up in old town just because it was possible to sell for more in this area. The Tibetan doctor mentioned to me that a lot of tourists that came to Shangri-la were interested in traditional Tibetan Medicine. The 5 star hotel in Shangri-la had a menu which you could buy Chongcao from. In addition to this, Chongcao was advertised in different places in the area. They were selling Chongcao at the national park and I saw it on advertisements in Lijiang. It seems to be a marketable draw for people in this area.

In Kunming I went to some traditional Chinese medicine stores to check on the price differences between here and Shangri-la. I found that per gram the prices here were about 100 Yuan/g more expensive. The stores that I found here were only selling Chongcao in boxes and bundled together in fancy displays. It could have just been the places that I went to but the prices were listed as significantly higher at between 220 to 264yuan/g for high quality.

Adulteration and Duplicates

With more interest and a higher value being placed on Chongcao in recent years there has been a rise in adulterated and counterfeit caterpillar fungus on the market. I didn't notice any adulterated Chongcao personally; the nature of the process is to make this unnoticeable to the unwilling buyer. However I was told that there are people that put lead or other metal filaments inside the caterpillar to increase the weight. Suspecting buyers can use a magnet in order find metal fragments that might be added to Chongcao.

I did however notice a lot of stores in Shangri-La that sold completely fake caterpillar fungus. When I first started researching this I could not tell the difference between real and fake and was surprised when my contact told me that what I was looking at was not real Chongcao. I am sure that other unsuspecting tourists fall into this same category. If you didn't have any suspicion that you could be sold fake caterpillar fungus I don't think you would suspect it at all. Usually dealers selling fake Chongcao were selling it for less than genuine by about 20-30 Yuan/g. Sometimes they did not separate it into two different bags like everyone else did and on one occasion the retailer attempted to bargain with me. My method for differentiating between the fake and real Cordyceps is to look closely at the area right under the head, on the real specimens you can see tiny legs which would be very difficult to fake. Also on a few fake specimens I noticed the paint used to color the body on the mushroom. These two parts are distinct colors on genuine caterpillar fungus.

Commercial Manufacture

Due to the influence of wild Cordyceps, companies have attempted to farm Cordyceps in a factory setting. Cordyceps is supposedly a hard thing to manufacture because of the unique conditions in which it grows in the wild. Aloha Manufacturing claims to be the world's largest

Cordyceps manufacturer. On their website it claims that they produce in excess of 175,000 Kg of Cordyceps per month. They also make the claim to produce a better kind of Cordyceps than the natural variety because of the unique methodology used in cultivating their Cordyceps which is patented. In order to reproduce not only the genetic similarities but the analytical similarities of natural Cordyceps they went to the Tibetan plateau and measured pH, soil and air temperature and composition, moisture content in the air and soil, the other micro-organisms found in the area. They make the claim that the Cordyceps they produce are more potent than natural Cordyceps. Their product is FDA approved, certified organic and kosher. On the website it explicitly states multiple times that it is 100% produced in the United States with no products coming from China. This seems to be a big selling point for them. It should be noted that the entire caterpillar and fungus part is used for consumption in China. Despite the focus on this product being biologically identical to variety that grows naturally manufacturers do not use caterpillars in growing their product. Instead they use grain as a substrate and sell the Cordyceps fungus in tablets. This process makes it much less expensive than the natural variety. Removing the caterpillar seems to remove the TCM properties. I don't believe this product would have any marketability in China.

Consumption

Chongcao can be consumed in a variety of different ways. The medicinal properties will work regardless of how it is consumed. However it has a pleasant neutral taste and can be prepared in foods such as soups and dumplings which is the preferred way to consume it for many. There are recipe books on ways to cook it. Another way is to grind the caterpillars into a powder and mix this with hot water drinking it like a tea. It is also possible to infuse the caterpillar within an alcoholic drink and drink it that way.

One thing that was emphasized by the TCM doctor is that Chongcao must be consumed orally in order to work. It has some kind of reaction with the bacteria in the stomach which causes it to gain its medicinal properties.

Medicinal Qualities

A search online results in a plethora of different uses for Chongcao. This was also a reflection of what I found during my interviews. The Tibetans who sold Chongcao and were involved with its harvest told me that it was good for overall health, impotence, weakness and fatigue. The Tibetan doctor I interviewed said that it was good for the main organs. He listed the heart, liver, and kidneys. He did not say anything about it being able to treat cancer which is properties emphasized in the western literature on Chongcao. When I asked him if it could treat cancer he said it was possible. The TCM applications for Chongcao are numerous and include, respiratory and pulmonary disease, renal, liver and cardiovascular disease. It is used to treat immune disorders, weakness and fatigue and increasing energy. It is used as an aphrodisiac for both men and women. (Holliday, 2008)

Clinical trials have been preformed but studies are limited and results are sometimes conflicting. It looks as though Chongcao may be effective for a variety of different ailments. Cancer research has shown it effective for some types of cancer and ineffective for others. More research needs to be done on this before conclusions are made about its effectiveness.

The supposed health effects cannot fully account for the high demand and price observed on the market. There are more cost effective treatments for many of the ailments Chongcao is accredited with treating. In order to understand the high value you must look at Chinese culture. Traditional Chinese medicine or is a way of treating sickness and maintaining health that borrows from the traditions of Buddhism, Confucianism and Daoism. TCM treatments include

use of many different animals believed to have different medicinal properties, and many different mushrooms which are also believed to have medicinal properties. It also employs acupuncture, which is believed to open the channels of Qi along the body.

Traditional Chinese medicine follows a different logic than western medicine where legitimacy is reached through scientific research. Chinese medicine has been around for much longer than the recent scrutiny of science. Chinese medicine gains legitimacy through its long history of use and tradition.

Daoism is the most important aspect to consider when discussing the health benefits of Chongcao. The Daoism aspect of TCM focuses on balance within the body. There are two primary forces within the body, Yin and Yang. These two opposite forces within the body are interconnected and give rise to each other in turn. This balance is depicted in the Taijitu, the symbol commonly referred to as the Yin Yang in the West. Yin is thought to manifest in dark, cold, low, female while Yang is thought to correspond to light, hot, high and male. The duality is not meant to represent good and evil which is sometimes the conception in Western thought. Once an element starts to reach its peak in a cycle then it begins its transition into its opposing element. For example once the night (yin) reaches its peak it then starts its transition into the day (Yang). This dualism can be observed in many different systems.

When you consider the full Chinese name for caterpillar fungus, which can be translated as winter worm summer grass, then you can start to understand the appeal. Cordyceps is both an animal, which is (Yang) and vegetable (Yin) it also incorporates the seasons of Winter (Yin) and Summer (Yang). A practitioner of traditional Chinese medicine described it to me as the perfect medicine from the perspective of TCM.

Adopting the perspective of TCM it is easy to understand how the balance believed to exist with Chongcao could be seen as the cure for many different ailments. TCM does not consider the mind and body to be separate, in fact the body is a reflection of the universe and the universe is a reflection of the body. Treating the body can treat the emotions. There is also a belief that different organs correspond to different emotions, for example the liver corresponds to the feeling of anger. Thus treatment for the liver might cause someone not to feel angry any longer. When considering the different stages of grief, anger, denial, depression and acceptance. Treating a patient for anger can help them get through to acceptance. It is easy to see how a medicine incorporating such a balance of elements and thought of as the “perfect” TCM medicine could be believed to cure such a variety of different ailments.

Also it is believed that some TCM medicines are not good for some people such as the young and elderly however TCM is believed to be good for everyone. In fact it is popular with the elderly and weak because it is seen to give energy and prevent aging. Taking too much Chongcao can lead to constipation. The TCM doctor that I spoke to considered this to be a reaction to too much Chi being in the body from taking Cordyceps.

While Chinese traditional medicine and Tibetan traditional medicine incorporate many of the same foundations Tibetan medicine lacks this emphasis on Daoism, a philosophy which originated in China. This could be a possible explanation in addition to the extreme price of Cordyceps as to why Tibetans do not use Cordyceps while Chinese do. Chongcao is seen as more effective from the TCM point of view than from the TTM point of view. Accordingly TTM employs a mixture of a wide variety of different herbs within their medicinal tonics. The TTM doctor that I talked to in Shangri-La told me that there are over 3000 medicinal herbs collected in the mountains around Shangri-La.

It is interesting that the size of the caterpillar affects the perceived quality and the price. The price is also negatively affected if the caterpillar is broken or damaged. These two qualities should not affect the potency or the medicinal qualities, all qualities have the same ratio of fungus to caterpillar. However the main determining factor for price is size and cohesion. I think this is telling about what a consumer looks for when searching for TCM. I think that regardless of other factors the rarest TCM medicine is seen to be the best.

Economic prosperity

Another explanation for the astronomical price of Chongcao is that many Chinese now have enough money to spend on luxury items. Although harvest has increased in the Tibetan areas that Chongcao grows, it is limited to the Tibetan plateau. Supply will never grow past the Tibetan plateau. This allows for a huge gain in price without a reactionary increase in supply. Since only people with a considerable amount of disposable wealth can afford Chongcao I believe that the use of Chongcao is a status symbol. When I asked my Tibetan friend why he thought it was so popular he told me that business men purchase large amounts of it to use at company parties. He also mentioned that large boxes of it are given to government officials in the form of bribes. Its use as a Chinese medicine makes it a part of a shared culture which people can connect through. I think this is a reason why it is so prized for wealthy business people.

Final Thoughts

The market for Chongcao has changed the way that Tibetans live. Because of the insane value placed on this strange organism it has become the best option for creating wealth. Communities have changed from agricultural and hunting life styles to primarily farming Chongcao. Fortunately this has proven to be a good thing for many. The harvest is modernizing much of Tibet. Communities that used to be extremely poor can now afford health care in case of

emergency, education for their children, as well as luxury items such as televisions and motorcycles. But Tibetans aren't the only ones getting rich from the sale of Chongcao. The language gap between the overwhelmingly uneducated Tibetans and their Chinese clients is a hindering factor and many Tibetans simply do not profit from the sale as much as they could. Tibetans don't have the long history of commerce like the Chinese, and they don't have connections to the main consumers. Chinese Hui Muslims from Gansu province as well as Han shop owners share in the market of Chongcao. Though Chongcao is harvested in the mountains of Tibet it isn't prized as a TTM medicine. Alternatively it is seen as the most precious herb in Chinese Medicine. It optimizes the yin and yang relationship as it is both animal and vegetable, both summer and winter. Chongcao is believed to cure a variety of ailments and is most likely not the miracle cure that some believe it is. However some of the clinical research that has been conducted has shown positive results and more research is needed before any conclusions are made. But perhaps analysis in this way is inappropriate. Like one of my interviewees said, "Americans don't understand Qi." Chongcao is being marketed in the west because of its perceived medicinal benefits however it has a long tradition of use in China. I doubt the branded version of Chongcao will catch on to the majority of Chinese. The appeal seems to come from the pairing of animal and vegetable, the one that is found in only one part of the world.

Such a dependence on this product for Tibetans is worrisome. It is unclear so far whether the intense harvest of this product is hurting future generations. The larvae have a 5 year life cycle so it might take some time to notice a change in population size. The village of Gongrilong is almost completely economically dependent on Chongcao. Fortunately the villagers were planning for the worst and were talking finding another source of income in tourism. I doubt this option is open for many other places in Tibet. I am hopeful that even if the population's crash,

perhaps this would only bring up prices further and these Tibetans would still be able to make a living. I don't believe the value of Chongcao will fall as long as the Chinese have money to spend on it.

Appendix: Subjective account

My base for research was in Shangri-La. I thought this location would be conducive to researching Chongcao because it is both a tourist destination as well the closest location that the program took us to the Tibetan area. Some other members of our class were staying here to conduct research as well as our friend James who we studied with during the semester and happened to be from an ideal location to conduct research on Chongcao. He invited me to travel to his home village to conduct research which I was very thankful for. I happened to have enrolled in the fall semester SIT China program. This didn't happen to be the warmest time to be in Shangri-La, nor was it the ideal time to study Chongcao. The best time would have been during the summer harvest season of May, June and July where I could have seen the harvesters doing their thing.

The first week I stayed in Shangri-la I was sick. It wasn't the worst cold I have ever had but when the outside temperature is as cold as it gets in Shangri-La and you don't have insulation in your room the only thing I wanted to do was stay in bed. This in turn, caused my first week to be relatively unproductive.

The original plan was to visit the home town of my friend, Gongrilong, unfortunately once this date came around, our friend, who is a tour guide found a client that took priority. He delayed the trip a week. We eventually left on November 19th. He had told us that the village he lived in, which is near Batang, would take about a day to get to. I believe it might take a day to get there if you travel through the TAR. Our student visas did not give us the proper

qualifications to do this. Instead it took three days to get to his hometown. Traveling turned out to be an adventure. We traveled on a bus from Shangri-la to Xiangchen. Once in Xiangcheng we found out that there was no bus running from there to Litang, which would be our next stop. Instead we had to travel using a private car. Fortunately we found a friend who was also going to Litang and a couple of Chinese women on the street who split the 700 Yuen cost with the three of us.

The difficulty of getting around was a theme to this trip. There also wasn't a bus going from Litang to Batang. I believe the lack of public bus was due to the season we chose to travel. I hear that in the summer there are a lot more tourists in this area trying to get around. We found another private car to take us in the direction of Batang. We actually got off the bus 30 min before we would have arrived in Batang at a small village called Bogexiang. From here we tried to call our friend to make sure we were in the right place before the car drove away. Our cell phones didn't have service here. All the sudden he descended from a hill on his motorcycle with three of his friends and we rode up the 8km trail to his village. The scenery from here was absolutely beautiful. This trip turned out to be well worth the hassle that it took to get around but it was still difficult and time consuming.

It was interesting seeing the village which was so dependent on Chongcao. It was very poor and small, but the people were happy and very welcoming. With the exception of one person, no one in the village spoke a word of Chinese. So communication was only done through James. This experience only gave me a shallow conception of what it was like in these villages, we only stayed for 3 nights, but it was interesting to visit this community. I also purchased some Chongcao for myself which I got for cheaper than had I bought it in Shangri-la.

The return trip took us 4 days this time. However, by just being in the area that Chongcao is harvested I did come across some people that turned out to be very helpful to my research. With the help of a fellow student, who was very helpful in translating questions, I was able to learn more about how Chongcao affected these people's lives. We met with a girl who had been Harvesting Chongcao since she was very young and some dealers of Chongcao. These dealers actually gave us a ride from Litang to Daocheng. It wasn't until after we had entered the car and were talking to them that we realized they were dealing Chongcao. These interactions happened by chance but I think it is very telling that the entire area was involved in the harvest and sale of Chongcao.

Once I returned to Shangri-la I had more of an understanding as to what Chongcao actually looked like. Now I could go around to the shops and ask to see it and ask them the price. I went to as many shops as I could find in one day and cataloged my results.

I was disappointed that I still had not made any leeway into understanding the obsession with this particular TCM medicine. So far I had only talked to Tibetans about Chongcao; Tibetans are not the primary consumers of caterpillar fungus. I needed to understand this issue from the Chinese point of view. When I got back in Kunming I scheduled an interview with Dr. Owen. For most of my other interviews I had to work through a translator but it was nice talking to Dr. Owen, with whom I could have a conversation in English. This is closer to the way that I traditionally find out information about things that I am interested in so it was refreshing for me.

The language was still an annoying barrier for me along my research. I had expected this but it is still frustrating. It was impossible for me to carry out an in depth research that I would have enjoyed if my language was better. I would have appreciated being able to talk to more lay people about it since this is a social phenomenon that effects them all.

I did eventually try Chongcao. I had considered eating some right after I got but realized that I didn't know how. I could have put some in alcohol and let it infuse but I figured this would cover up the taste which I also wanted to experience. I didn't have a mortar and pestle to grind it into a powder and drink as a tea so I waited until I got back to Kunming. My home stay family who turned out to be fans of Chongcao made Chongcao chicken soup for me. The soup was good; the caterpillars had a mild taste. They do swell up when soaked in liquid for a while so I felt like I got to eat more than I had actually purchase. I didn't feel any immediate effects from consuming it. It's more than possible that I didn't have enough to notice anything but Chongcao is ridiculously expensive and I can't afford to eat that much.

Topics for Further research

Medicinal studies need to be carried out on Chongcao.

If the opportunity ever presents itself, research into the production of fake Chongcao would be fascinating.

This is unrelated to caterpillar fungus, but I think looking into the Chinese perspective on hiking nature versus the western perspective

Itinerary

I started in Shangri-la

November 19th- Took a bus to Xiangcheng

November 20th -Took a private car to Litang

November 21st – Arrived in Gongrilong

November 24th – Took a car back to Litang

November 25th – Took a car to Daocheng

November 26th – Took a car to Xiangcheng

November 27th – Arrived back in Shangri-la

December 1st – Bus to Tiger Leaping Gorge

December 2nd – Bus to Lijiang then took a night train back to Kunming

Works Cited

Dermick, Barbara. "A 'worm' worth Its Weight in Gold." *Los Angeles Times* 27 June 2008. Print.

Holliday, John C., and Matt Cleaver. "Medicinal Value of the Caterpillar Fungi Species of the Genus *Cordyceps* (Fr.) Link (Ascomycetes). A Review." *International Journal of Medicinal Mushrooms* 10.3 (2008): 219-34. Print.

(<http://www.javascriptkit.com>), By JavaScriptKit.com. "Cordyceps | Organic Cordyceps Sinensis from Aloha Medicinals." *Aloha Medicinals Inc. | Organic Medicinal Mushroom Health Products*. Web. 09 Dec. 2010. <<http://www.alohamedicinals.com/cordyceps.html>>.

The Troubled Harvest of Tibets Caterpillar Fungus. By Johnathan Watts and Cui Zheng.

Guardian.co.uk. 3 Sept. 2010. Web.

<<http://www.guardian.co.uk/environment/video/2010/sep/03/tibet-caterpillar-fungus>>.

Winkler, Daniel. "Caterpillar Fungus (*Ophiocordyceps Sinensis*) Production and Sustainability on the Tibetan Plateau and in the Himalayas." *Chinese Journal of Grassland* 32 (2010): 96-108. Print.

Winkler, Daniel. "Cordyceps Sinensis A Precious Parasitic Fungus Infecting Tibet."

Alternative:Field Mycology 20.59 (2010): 61-67. Print.

Winkler, Daniel. "The Mushrooming Fungi Market in Tibet - Exemplified by *Cordyceps Sinensis* - and *Tricholoma Matsutake*." *Journal of the International Association of Tibetan Studies* 4 (2008): 1-47. Print.

Human Resources

James: My contact in Gongrilong. He was very helpful for my research and generous to let us visit his hometown.

Dr. Owen: TCM and Western medicine doctor in Kunming, he taught me a lot about TCM medicine as well as the appeal of Chongcao.

Dr. Turk: TTM medicine doctor in Shangri-la. He was a doctor for 20 years at the largest TTM hospital in all of China.

My Kunming Homestay family was very nice to prepare caterpillar soup for me. As well as talk to me about Chongcao.