

# CHAPTER - I

## INTRODUCTION

### 1.1 Parasites and Parasitism

No country in the world is free from parasites and parasitic diseases. Nepal cannot be the exception to this bitter reality. Living organisms that derive their nourishment, shelter and protection from other organisms are called parasites, this association being called parasitism. Parasites are organisms that obtain food and shelter by living on or within another organism. The parasite derives all benefits from this association and the host may either not be harmed or may suffer the consequences of this association, a parasitic disease.

The parasite is termed obligate when it can live only in association with a host or it is classified as facultative when it can live both in and on a host as well as in a free form. Parasites, which live inside the body, are termed endoparasites whereas those, which exist on the body surface, are called ectoparasites. Parasites that cause harm to the host are pathogenic parasites while those that benefit from the host without causing it any harm are known as commensals.

Parasitic effect resulting in diseased condition in an individual is known as parasitic infection. Parasitic infections are basically categorized as

- ) Viral infection
- ) Bacterial infection
- ) Protozoan infection
- ) Helminthic infection

Millions of microscopic organisms live around us in the air, water, soil and in our body. They are called microorganisms. Some keep us healthy, but others make us sick. Bacteria, viruses and other infectious organisms live everywhere, in the air, on food, plants and animals; in the soil and in the water; and on just about every other surface including our own body.

Most of these organisms (microbes) won't harm us. But others can cause infection. Microbial effect resulting in diseased condition in an individual is known as microbial infection.

## 1.2 *Ganoderma*

*Ganoderma* is a kind of red mushroom, which has high ranking in the world of fungi. For centuries, the Chinese regard it as 'King of Herbs' for its excellent effect in improving overall health, enhancing stamina and promoting longevity. *Ganoderma* is a rare mushroom and has magical effects in enhancing the double health status. This precious mushroom is entitled as "Universal Medicine", "Gift of Heaven" or "Kaliyug ko Sanjeevani Buti" etc. Known as Reishi or Mannentake to the Japanese and Ling Zhi to the Chinese, *G. lucidum* is renowned for its medicinal properties. "Reishi" is one of the most well known herbal remedies in traditional Chinese medicine. This species of the Polyporaceae family of fungus is also commonly referred to as "God's Herb". Uses in traditional healing include increasing intellectual capacity and memory, promoting agility and lengthening the life span.

**RED REISHI** is referred to as a "Superior Medicine" because when compared to the ordinary medicine it has the following superior qualities:

1. Daily consumption is acceptable and has no side effects.
2. Regular consumption of Reishi will regulate bodily functions to its normal forms.
3. Its medical power is effective in all organ functions.
4. Reishi mushroom is called the "Mushroom of Immortality" in China and has been used as a tonic and strengthening medicine for thousands of years.

Several of the key compounds in reishi mushroom have been studied for their potential to enhance overall health and increase life expectancy (Jong *et al.*, 1992). These benefits are thought to arise partly from reishi's role as an antioxidant (Lin *et al.*, 1995). Also, reishi may boost endurance and oxygenation of cells.

Reishi has also been researched for its possible ability to inhibit cancerous tumor growth, especially when caused by exposure to radiation (Wachtel-Galor *et al.*, 2004). One study in mice reported tumor inhibition rates of 90 percent and tumor regression 75 percent of the time (Sone *et al.*, 1985).

Results in diabetic test subjects have been comparable to those produced by conventional insulin therapies (Teow, 1996). In addition to supporting overall cardiovascular health, reishi may offer benefits to people with high blood pressure. Studies suggest a lowering of systolic and diastolic blood pressure is possible when reishi is administered (Kanmatsuse *et al.*, 1985).

Finally, reishi has been used to treat herpes and a number of complications that arise from the infection (Eo *et al.*, 1999 and Hijikata *et al.*, 1998). What's more, some studies point to evidence that reishi may help the body fight HIV infection (Hijikata *et al.*, 1998).

### **Importance of *Ganoderma* in Microbial Infections**

- ) *Ganoderma* (Lingzhi) increases immunity and is useful in AIDS patient. It has antimicrobial activity against influenza virus and dysentery. The dosage is one to two teaspoonfuls two times daily. (www.famepharma.com)
- ) Lingzhi has been found to be antiviral, anti-parasitic, and anti-fungal. It has also been used in HIV support. It has been found clinically to reduce side effects like throat infection, loss of appetite and insomnia. (<http://en.wikipedia.org/wiki>).
- ) Reishi is a mushroom that is used for hepatitis and post-herpetic neuralgia (nerve pain following a herpes infection) (Hijikata and Yamada, 1998).
- ) The minimum concentration of ganoderiol F (6a) and ganodermanontriol (7a) for complete inhibition of HIV-1 induced cytopathic effect in MT-4 cells is 7.8- $\mu\text{g ml}^{-1}$ . Ganoderic acid B (8a) inhibits HIV-1 protease with an IC 50 value of 0.17 mM (El-Mekawy, *et al.*, 1998). Ganodermediol (6b), lucidadiol (9a) and applanoxidic acid G (2c), isolated from *G. pfeifferi*, but also known from other *Ganoderma* species, possess in vitro antiviral activity against influenza virus type A. Further, ganodermediol (6b) is active against herpes simplex virus type 1, causing lip exanthema and other symptoms [IC 50 in Vero cells 0.068 mmol l<sup>-1</sup> (Mothana *et al.*, 2003)].
- ) Reishi is antibacterial, against Staphylococci, Streptococci, and *Bacillus pneumoniae* (perhaps due to increased immune system activity), has antiviral effect by inducing interferon production and anti-HIV activity in vitro and in vivo (www.reishiessence.com)
- ) *Ganoderma* (Reishi) has been used to treat herpes and a number of complications that arise from the infection. (Eo *et al.*, 1999, Hijikata *et al.*, 1998)

- J) *G. lucidum* has been shown to be effective in the treatment of Hepatitis B resulting in the lowering of SGPT and SCOT levels to normal, and the sero- conversion of HBs antigen to HE, antibody (Teow, 1997) Extract of *G. lucidum* when administered concurrently with glutathione against liver damage by carbon tetrachloride, proved to be beneficial against hepatic necrosis and hepatitis (Byun *et al.*, 1987) The extract is highly effective in improving and in most cases curing Hepatitis A, B, and C within a period of three months.
- J) According to Dr. Gilbert Ng, who has maintained a web page on Lingzhi, research over the past 30 years has found that this plant can be used for the treatment of common cold, influenza, cough, and toothache. (www.e2121.com)
- J) Administration of hot water soluble extracts of *Ganoderma lucidum* (36 to 72 g dry weight/day) decreased pain dramatically in two patients with postherpetic neuralgia recalcitrant to standard therapy and two other patients with severe pain due to herpes zoster infection. (Hijikata *et al.*, 1998).

### **1.3 Statement of the Problem**

*Ganoderma* is a rare mushroom, regarded by the Chinese as “King of Herbs” because of its magical effects in enhancing the double health status. Since 1970 (i.e. after the discovery of cultivation of *Ganoderma* by Yukio Hanoi, Kyoto University) studies and researches on *Ganoderma* took place at full pace on account of its unlimited health related beneficial effects on mankind.

However in Nepal very little is known about this precious mushroom entitled “Universal Medicine”, “Gift of Heaven” or “ Kaliyug ko Sanjeevani Buti ” etc. Hence only a very small number of the Nepalese are enjoying the benefits of *Ganoderma*. Due to ignorance of the red mushroom, a large proportion of the Nepalese population is deprived of its benefits, which they deserve. So the attempt is made with the view (expectation) to shed light upon this issue so as to act in favour of the welfare of majority of the Nepalese population with regard to their health aspects.

## CHAPTER - II

### 2.1 Objectives of the Study

The study focuses on the following objectives.

#### General Objective

To investigate the role of *Ganoderma* in the control and prevention of microbial infections.

#### Specific Objectives

- ) To study the role of *Ganoderma* in the control and prevention of microbial infections in Kathmandu, Lalitpur and Kaski districts.
- ) To analyze the health status of study population before and after adopting ganotherapy in the study area.
- ) To explore the microbial diseases for which ganotherapy is commonly adopted in the study population.
- ) To assess the knowledge, attitude and practices of *Ganoderma* in the control and prevention of microbial infections in the study area.
- ) To arouse awareness about *Ganoderma* and its medical benefits to the Nepalese population so that they can be benefited by it to the greatest extent.

### 2.2 Limitations of the study

- ) Study on *Ganoderma* has hardly been started in Nepal i.e., almost nothing has been studied about it in the past. Since this is the very first attempt made to write a thesis on *Ganoderma* in relation to health or diseases, sufficient materials are not available leading to inconvenience in its study.
- ) Since the products of *Ganoderma* are relatively expensive, its use is restricted to primarily economically advantaged group of people only. Hence the access to these people for data collection for study is also very limited.
- ) Due to public ignorance of *Ganoderma* sufficient consumers are not available to carry out its study effectively.
- ) Since very limited number of people are aware of *Ganoderma* and its beneficial effects the cases of *Ganoderma* consumers associated with microbial infections are even rarer leading to further inconvenience in the study.

Sex and age group were not considered in this study due to its very limited use by this category of consumers. i.e., consumers who have used *Ganoderma* for microbial diseases.

## CHAPTER - III

### GANODERMA: AN INTRODUCTION

#### 3.1 Scientific classification

Kingdom: Fungi  
Phylum: Basidiomycota  
Class: Homobasidiomycetes  
Order: Polyporales  
Family: Ganodermataceae  
Genus: *Ganoderma*  
Species: *lucidum*  
Binomial name: *Ganoderma lucidium*

*Ganoderma* is a kind of red mushroom, which has high ranking in the world of fungi. This precious mushroom entitled as “Universal Medicine”, “Gift of Heaven”, “Kaliyug ko Sanjeevani Buti”, "God’s Herb", or "Mushroom of Immortality" etc has been used as a tonic and strengthening medicine for thousands of years, and is renown for its medicinal properties. It is one of the most well known herbal remedies in traditional Chinese medicine.

#### 3.2 History of Reishi

"Seng Nong's Herbal Classic" is considered to be the earliest manuscript on Chinese materia medica and is still today the foundation of Traditional Chinese Medicine and in general all Oriental Medicine.

Seng Nong's Herbal Classic describes Ling-zhi in detail: among 365 species of plants, roots, wood, fur, animals and stones, divided into 3 grades, Ling-zhi is listed No.1 among the first "superior" grade. The characteristic of the first grade is that no side effects occurs even being taken for a long period of time. On the contrary, longer taking reduces weight and extends life.

The book, which is known in Japan as "Shinnoh Honsohkyo", is now accepted as being the original textbook of Oriental medical science. In it, 365 kinds of medicines are classified and explained. The medicines are basically classified into three categories: 120 of them are declared to be "superior" medicines, another 120 are classified as "average" medicines, and the remaining 125 are placed in the "fair" category. The "superior" medicines are called "God's Herbs" and they are for perpetual youth and longevity. The "average" category medicines are those, which can be taken as a tonic, and those in the "fair" category are taken to remedy specific ailments.

To find Ling-zhi in ancient times, people had to go high up on the mountains and deep into the forests to harvest this most valuable medicine. The discovery of Ling-zhi, which was very scarce, and which was believed to bring eternal longevity, led to wide spread festivities. Ling-zhi was so valued it was used almost exclusively by Emperors and by courtesans.

Many cultures embraced Reishi's benefits; the Romans considered mushrooms to be 'the food of the Gods', the Egyptians believed them to be 'a gift from Osiris' and the Chinese thought of them as 'the elixir of life'. In ancient Chinese culture Reishi is the focus of a Chinese fairy tale, "The White Snake." In this fairy tale the heroine, in an attempt to save her lover's life, tries to steal a Reishi plant from the Gods.(Sing 2003).

Cultivation was attempted since ancient times in China but did not give satisfactory results both quality wise and quantity wise. It is only in 1971 that a Japanese researcher Yukio Naoi from the Kyoto University found ways to cultivate Ling-zhi or Reishi in quantity. Since the discovery of this method and with further amelioration, the production of Reishi raised more than 10 folds in the last ten years. Today, an estimated 4,300 tons of Ling-zhi is produced yearly in the world, with China producing 3,000 tons followed by Korea, Taiwan, Japan, Thailand, USA, Malaysia, Vietnam, Indonesia and Sri Lanka.

### 3.3 Six Species of Lingzhi

Six species of Ling-zhi, differentiated by colors namely red, purple, green, white, yellow and black and their shape are mentioned in the Seng Nong classic. Different Lingzhi nourishes different parts of the body; red Lingzhi for heart, purple Lingzhi for joints, green Lingzhi for liver, white Lingzhi for lung and skin, black Lingzhi for the kidney and the brain, while yellow Lingzhi for spleen. Reishi Gano (GL) is a combination of these six species of *Ganoderma*.



**Kimshen Gano**



**Peacock Gano**



**Liver Gano**



**Brain Gano**



**Heart Gano**



**Ruyi Gano**

### **3.4 Effects of *Ganoderma***

- A. Scanning - Gano can help to detect hidden diseases in the body and proceed to regulate back the body; from the reaction we can identify the ailing area. This is known as scanning effect of *Ganoderma*.
- B. Cleansing - Detoxication: *Ganoderma* has the strongest effect in removing the toxins viz, uric acid, excess cholesterol, fat deposit, calcium deposit, bad tissue, chemical accumulation.
- C. Regulating: Balancing effect to restore the body function back to normal.
- D. Building: Build up the immune system, physical strength and mental calmness i.e., more resistance to disease.
- E. Regeneration: Rejuvenating effect i.e. restores youthful appearance, strength and peacefulness, which one may lose as a result of various health hazards.

### **Pharmaceutical Properties of *Ganoderma* (Lingzhi)**

The rediscovery of Reishi in Japan, prompted medical practitioners and herbalists to investigate extensively the medical effects and applications of Lingzhi in Korea, Japan and China. However, it was only during the last 20 years that Lingzhi has received the attention of pharmacologists and scientists.

Currently there are more than 2,000 biochemical and pharmacological reports published on the medicinal properties of *Ganoderma lucidum* and its active principles. These studies have identified the effects of Lingzhi as mainly that of polysaccharides, triterpenes, adenosine and essential fatty acids.

### **Polysaccharides**



Polysaccharide in Lingzhi stimulates immune function and thereby suppresses tumor growth. A number of studies have shown that polysaccharides in medicinal mushrooms indeed have antitumor and immune stimulating properties. The fruiting body and mycelium are very rich in bioactive polysaccharides. These bioactive polysaccharides contain mostly Beta-D-glucans which stimulate surface receptors. The surface receptors under stimulation produce a number of antiviral and antitumor chemicals; namely cytokines, lymphokines, tumor necrosis factor, and interferon. Interferon helps to block off viruses and bacteria from attacking healthy tissue.

Macrophages of our immune system destroy pathogens such as bacteria, yeast cells, virus infected cells etc. NK cells ward off viruses and cancer cells. Polysaccharide molecules activate our immune system to respond, which in turn activates immune effector's cell responses including an increase in macrophage and killer T-cell activity.

The immuno-modulation affected by the polysaccharides in Lingzhi enhances the immune system that is suppressed by cancer and HIV. This very powerful immune modulation system together with the very low levels of toxicity throw light as to why Lingzhi consumed over long periods is being used effectively in the treatment of autoimmune diseases, AIDS and patients undergoing chemotherapy and radiotherapy.

Furthermore, the low molecular weight of polysaccharides found in Lingzhi have shown to have a marked antiviral activity, while its higher molecular weight polysaccharides have a better anti cancer effect.

## **Triterpenes**

Another set of active components found in *Ganoderma lucidum* are triterpenes. They enhance the action of our body's hormones. Investigations have found that Lingzhi contains rich amounts of triterpenes in both the mycelium and fruiting body. The vast majority of triterpenoids occur as lucidenic and ganoderic acids. The triterpenes have anti allergic properties. Triterpenoids likewise enhance consumption of oxygen and have insulin like action and increases the peripheral utilization of glucose. They inhibit the synthesis of cholesterol and helps keep it within the normal range. These triterpenes have been found to have a liver protective action.

## **Adenosine**

Adenosine found in the cells plays an important role in muscle contraction and sugar metabolism. It has a neuroprotective action on the brain. Lingzhi when administered in cases of acute myocardial infarction (heart attacks) results in smaller infarction size and improved blood flow. It has now become clear that the adenosine content acts as a coronary vasodilator. Modern studies have therefore confirmed and explained of medicinal usage of Lingzhi for stimulation of heart diseases. Adenosine increases the rate of wound healing. Adenosine besides being a powerful vasodilator also prevents blood platelet aggregation.

## **Sterols**

The same investigations on triterpene also showed that the mycelium of *Ganoderma* is rich in sterols, components in the cell membranes of both plants and animal that act as hormone precursors i.e. building blocks of steroids. On going clinical studies are now being conducted using sterols in rheumatoid arthritis, cervical lesions induced by human papilloma virus, sinusitis, hepatitis C and allergies.

## **Germanium**

Germanium; a mineral found in small quantities in some foods and in coal deposits is a powerful immunomodulator which increases blood flow and oxygen supply to the different organs of the body and thus plays an integral part in the metabolism of the body. Dr. Asai, a pioneer of studies on germanium noted that shelf fungus a species of Lingzhi contained high levels of Germanium. From a biochemical point of view germanium seems to be acting at the cellular level. Germanium is effective when consumed in minute quantities, is believed that germanium in Lingzhi stimulates interferon production and enhances the oxygen carrying capacity.

### 3.5 Standard Dose

#### **EXACTLY WHAT IS THE RIGHT DOSAGE OF REISHI ONE MUST CONSUME?**

The consumption amount of Reishi differs from individuals. A pack (2 tablets) a day for a healthy person will enhance immune system, aid blood circulation, increase and strengthen vitality and make the person less prone to diseases. An individual with discomforts should take 2 - 4 packs a day and those who are suffering from terminal illnesses should take large dosage. Reishi is also a dietary supplement; a high consumption level is harmless. It does not produce any side effects like most chemical drugs. You can consume Reishi even if you are on other medications.

- ) Start with low dose and increase gradually. Always start from 2 capsules per day. One at morning, one at evening or taken both the capsules at the same time.
- ) As symptoms of disease disappear, reduce to normal one dose. If the reaction is vigorous, reduce to one capsule per day
- ) Generally for health keeping, a dosage of two-to-four capsules per day is sufficient.

For treatment of any disease, general dosage of six to twelve is recommended. But the dosage should gradually increase from two per day, four per day, at the addition of two at interval of five days. Take until the effect comes.

- ) Similarly when reducing also, reduce slowly.
- ) Best taken while empty stomach. However, for gastric and ulcer patients take after meal.
- ) When you are taking Reishi, you can also take your regular medicine.
- ) The dose of Reishi can be gradually increased and the dose of other medicines can be reduced accordingly. After complete relief from the disease, other medicines can be stopped totally.

### 3.6 DXN (DAXEN)

DXN is an abbreviation of DAXEN, a Chinese word that signifies the prosperity and integrity of any individual or group. DXN was founded by Dr. Lim Siow Jin, a graduate from the famed Indian Institute of Technology. Dr. Lim Siow Jin has a deep interest in mushrooms

and their relationship with human health. To understand this relationship better, Dr. Lim Siow Jin traveled far and wide in search of “The King of all Herbs – Lingzhi”. After more than twenty years' of research and scientific analysis, Dr. Lim Siow Jin finally discovered Lingzhi, the king of herbs that would benefit all mankind. Realizing the importance and the benefits of Lingzhi, Dr. Lim Siow Jin began sharing his knowledge about this miraculous herb with his friends, who were greatly impressed with its benefits and medicinal value. However, Dr. Lim Siow Jin didn't stop there. He felt that he should form a company that would help more people know and derive the benefits of this miraculous herb. In 1993 Dr Lim's dream came true when he established DXN. DXN is a local direct sales company producing *Ganoderma lucidium* and *Ganoderma mycelium*. It manages to progress very fast by virtue of ONE DRAGON, ONE MARKET, ONE MIND concept. ONE DRAGON means the entire process, from cultivation up to marketing solely handled by the company. ONE MARKET means the distributors will enjoy worldwide bonus with single membership card. ONE MIND means the company concentrating on how to achieve the Global Vision and hope that all the distributors will grasp this great opportunity and single-mindedly concentrates on doing the DXN business.

### **Some DXN Products**



### **DXN Products**

#### **Reishi Gano (RG)**

Reishi Gano (RG) is a kind of mushroom essence (*Ganoderma lucidium*) containing polysaccharide, adenosine, triterpenoids, protein and fiber. Supplementation of RG can

effectively help to improve general health, activate body resistance, improve body function, regulate digestive system, smooth skin. RG is available in the capsule form and in powder form and contains 100% *Ganoderma*. So RG is highly effective against many diseases.

### **Ganocelium (GL)**

Ganocelium (GL) is the mycelium of *Ganoderma lucidum* rich in polysaccharide, vitamins and minerals. GL can help to improve bodily functions and blood circulation. Like RG it is also available in capsule and powder form with 100% *Ganoderma*, which is highly effective against a number of diseases.

### **Lingzhi Coffee (3 in 1)**

DXN Lingzhi Coffee 3 in 1 is specially blended with coffee beans of the finest quality and 100% pure Lingzhi with no artificial coloring, flavoring and preservatives. Therefore it is very refreshing and healthy.

### **Lingzhi Black Coffee**

For those who want it black and strong and clamor for coffee with that "midnight perk," Lingzhi Black Coffee is a unique coffee drink that contains the extract of ancient Chinese medical herb called Lingzhi. What's more, it contains no sugar and therefore perfect for diabetics.

### **Ganozhi Toothpaste**

DXN Ganozhi toothpaste does not contain saccharin and colouring. It contains high quality *Ganoderma*, food gel, menthol and food flavoring. It can effectively cleanse your teeth thus leaving a pleasant flavour in your mouth. It also makes your teeth healthier and brighter.

### **Ganozhi Shampoo**

DXN Shampoo with pH balance is suitable for all types of hair. Enriched with *Ganoderma* extract and vitamin B5, DXN Shampoo is mild and makes your hair healthier, softer and shinier.

### **Ganozhi Soap**

Ganozhi soap is specially formulated and enriched with *Ganoderma* extract and palm oil. It gently cleanses the skin while preserving its natural oils without damaging skin structure.

### Ganozhi massage Oil

Gano massage Oil contains *Ganoderma* extract and Palm Oil. Gano Massage Oil is suitable for daily use. Use Gano Massage Oil everyday to provide you and your family smooth and supple skin.

### 3.7 Some Researches carried out on *Ganoderma lucidum*

- Abstract -** Anti-hepatitis B activities of ganoderic acid from *Ganoderma lucidum*. (Li *et al.*, 2006).
- Abstract -** Anti-hepatitis activities in the broth of *Ganoderma lucidum* supplemented with a Chinese herbal medicine.(Li *et al.*, 2006).
- Abstract -** Effect of an herbal formula containing *Ganoderma lucidum* on reduction of herpes zoster pain: a pilot clinical trial. (Hijikata *et al.*, 2005)
- Abstract -** Lucidenic acids P and Q, methyl lucidenate P, and other triterpenoids from the fungus *Ganoderma lucidum* and their inhibitory effects on Epstein-Barr virus activation. (Iwatsuki *et al.*, 2003)
- Abstract -** Antiherpetic activities of various protein bound polysaccharides isolated from *Ganoderma lucidum*.(Eo *et al.*, 1999).
- Abstract -** Anti-HIV-1 and anti-HIV-1-protease substances from *Ganoderma lucidum*. (el-Mekkawy *et al.*, 1998).
- Abstract -** Effect of *Ganoderma lucidum* on postherpetic neuralgia.(Hijikata *et al.*, 1998).
- Abstract -** Triterpenes from the spores of *Ganoderma lucidum* and their inhibitory activity against HIV-1 protease.(Min *et al.*, 1998).
- Abstract -** Antimicrobial activity of *Ganoderma lucidum* extract alone and in combination with some antibiotics.(Yoon *et al.*, 1994).
- Abstract -** Antiviral activities of various water and methanol soluble substances isolated from *Ganoderma lucidum*.(Eo *et al.*, 1999).

**Abstract-** Antiherpetic activities of acidic protein bound polysacchride isolated from *Ganoderma lucidum* alone and in combinations with acyclovir and vidarabine.(Oh *et al.*, 2000):

## **CHAPTER - IV**

### **REVIEW OF RELATED LITERATURE**

No study regarding *Ganoderma* and health/diseases conducted in Nepalese population was found. It is believed that

this is the first attempt to carry out studies on *Ganoderma* in relation to diseases in Nepalese population. Therefore it was indeed very difficult to find related literature, as there were not sufficient research materials and documents of related works on *Ganoderma*. Yet the available works, which were more or less related to the present study, was briefed. The relevant studies from various sources for the further studies have been presented in this chapter in order to provide the background material to evaluate the significance of this study as well as to interpret its findings. The studies reviewed have been given as follows:

- J) Preclinical (in vitro and in vivo animal) studies by Yihuai *et al.*, (2005) indicate that *Ganoderma* exhibits a broad spectrum of antibacterial and antiviral activities. Polysaccharides or triterpenoids from *Ganoderma* showed activities against Herpes simple virus, Hepatitis B virus, HIV and Epstein-Barr virus in vitro or in animal models.
- J) Lingzhi (*Ganoderma*) has been used for the treatment of sore throats. A suspension of Lingzhi powder when gargled, greatly reduce the pain and severity of throat infection. The anti-inflammatory and in some cases, the anti viral action of Lingzhi explains this effect (Yoon *et al.*, 1994).
- J) Reishi is antibacterial, against Staphylococci, Streptococci, and *Bacillus pneumonia* (perhaps due to increased immune system activity), has antiviral effect, by inducing interferon production and has anti-HIV activity in vitro and in vivo. (www.reishiessence.com)



- ) The research study carried out by Li *et al.*, (2005) on “Possible mechanism underlying the antiherpetic activity of a proteoglycan isolated from the mycelia of *Ganoderma lucidum* in vitro” has shown that the antiviral effects of GLPG (*Ganoderma lucidum* proteoglycan) were more remarkable before viral treatment than after treatment. Although the precise mechanism has yet to be defined, the work suggests that GLPG inhibits viral replication by interfering with the early events of viral adsorption and entry into target cells. Thus, this proteoglycan appears to be a candidate anti-HSV (Herpes simplex virus) agent.
- ) The International AIDS Society (IAS) held its third conference on HIV pathogenesis and treatment in Rio de Janeiro, Brazil, from July 24-279 (Porter *et al.*, 2005). With HIV infection, higher levels of TNF drive viral replication and may be related to the wasting syndrome seen in some HIV-positive patients. Elevated levels of activated NF kappa B are also found in chronic inflammatory conditions and also contribute to intensified HIV viral replication. The goal of the research was to determine if Ling Zhi was able to reduce the amount of these pro-inflammatory mediators.
- ) In the study on” Possible mode of action of antiherpetic activities of a proteoglycan isolated from the mycelia of

*Ganoderma lucidum* in vitro” by Zheng et al., (2004) antiviral activities of a proteoglycan GLPG against herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2) were investigated and its effect in pre-treated and treated during virus infection with GLPG were more remarkable than the treatment of post-infection. The result suggested that GLPG inhibits viral replication by interfering with the early events of viral adsorption and entry into target cells. Thus, this proteoglycan seems to be a potential candidate for anti-HSV agents.

- ) The study on “Effect of *Ganoderma* on postherpetic neuralgia” by Hijikata and Yamada, (1998) has revealed that Reishi is the mushroom that is used for hepatitis and post-herpetic neuralgia (nerve pain following a herpes infection).
- ) The Bastyr study showed that in vitro, Ling Zhi decreases the amount of TNF produced as well as reducing the amount of activated NF kappa B. Among health volunteers who took reishi for 2 weeks, the amount of TNF produced by their immune cells was significantly reduced; the reduction in TNF was first described after 1 week of reishi use and continued at a significantly reduced level for an additional week. Following a 1-week washout period, TNF

levels returned to their baseline values (Leonard *et al.*,2005).

- ) According to Technical Reference Bulletin by Dr. James Zhou, Ph.D (2002) *Ganoderma* (Reishi) has antimicrobial effects and controls/ prevents liver infection. (www.members.aol.com)
- ) The antiviral activities against herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2) were investigated in a study carried out on “Possible mode of antiviral activity of acidic protein bound polysaccharide isolated from *Ganoderma lucidum* on herpes simplex viruses” by Eo *et al.*, (2000). APBP exhibited more potent HSV-1 and HSV-2 antiviral activity than NPBP (neutral protein bound polysaccharide) with 50% effective concentration The results show that the antiherpetic activity of APBP (acidic protein bound polysaccharide) seems to be related to its binding with HSV-specific glycoproteins responsible for the attachment and penetration, and APBP impedes the complex interactions of viruses with cell plasma membranes
- ) According to Eo *et al.*, 1999, Hijikata *et al.*, 1998 *Ganoderma* (Reishi) has been used to treat herpes and a number of complications that arise from the infection What’s more, some studies point to evidence that reishi

may help the body fight HIV infection (el-Mekkawy *et al.*, 1998).

- ) Hijikata and Yamada, (1998) discovered that administration of hot water soluble extracts of *Ganoderma lucidum* (36 to 72 g dry weight/day) decreased pain dramatically in two patients with postherpetic neuralgia recalcitrant to standard therapy and two other patients with severe pain due to herpes zoster infection.
- ) A double-blind, randomized, placebo-controlled clinical study by Yihuai *et al.*, 2005 indicated that treatment of hepatitis B patients with *G. lucidum* polysaccharides at 5400 mg/day for 12 weeks resulted in significantly decreased serum HBV DNA and hepatitis B e antigen (HbeAg) levels. *Ganoderma* may play an adjunct role for the management of bacterial and viral infection.
- ) In Japan and China, *Ganoderma* is also used to treat symptoms of viral diseases such as colds, influenza, canker sores, and hepatitis ([www.findarticles.com](http://www.findarticles.com))
- ) Two water soluble substances, GLhw and GLlw, and eight methanol soluble substances, GLMe-1-8, isolated from *Ganoderma* were examined for their activities against five strains of pathogenic viruses such as herpes simplex virus types 1 (HSV-1) and 2 (HSV-2), influenza A virus (Flu A) and vesicular stomatitis virus (VSV) Indiana and New Jersey strains in vitro. Five substances, GLhw, GLMe-1, -2, -4 and -7 significantly inhibited the cytopathic effects of HSV and VSV. GLhw inhibited plaque formation of HSV-2 and HEp-2 cells while it exhibited potent antiviral activity

on the VSV New Jersey strain with an SI of more than 5.43. These results indicate the possibility of development of antiviral agents from basidiomycetous fungi (Eo SK *et al.*, 1999).

- ) Arboviruses (vesicular stomatitis virus) or viruses carried by insects are among the most common causes of viral encephalitis. Eo SK *et al.*, 1999 examined various water and methanol soluble substances of *Ganoderma lucidum* for their activities against various strains of pathogenic viruses including vesicular stomatitis virus (VSV), which cause viral encephalitis.
- ) According to Van Benschoten (1988) for infectious mononucleosis, also referred to as "mono" or "the kissing disease," caused by Epstein - Bar virus which causes symptoms that include fever, sore throat, and swollen glands. Reishi mushroom (*Ganoderma lucidum*), 150 - 300 mg two to three times daily is used for inflammation and immunity. A tincture of this mushroom extract, 30 - 60 drops two to three times a day may also be taken.
- ) To investigate antiherpetic activity, an acidic protein bound polysaccharide (APBP) isolated from carpophores of *Ganoderma lucidum* was tested for its antiviral activity against herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2) which showed potent antiviral activity against

these viruses in Vero cells at its 50% effective concentration (EC (50)) of 300 and 440 microg/ml, respectively. APBP exhibited a potent antiviral activity with selectivity index (SI) of more than 22.73. The combined antiherpetic effects of APBP with protein antiviral agents, interferon alpha (IFN alpha) and interferon gamma (IFN gamma), were examined on the multiplication of these two strains of herpesviruses in Vero cells. These results suggest the possibility of developing APBP as a new antiherpetic agent (Kim *et al.*, 2000).

- ) Hijikata and Yamada, (1998), observed that administration of hot water extracts of a herbal formula containing *Ganoderma lucidum*, WTMCGEPP decreased herpes zoster pain for five Japanese patients suffering from shingles. Pain relief started within a few days of intake and was almost complete within 10 days.
- ) Two acute herpes zoster with manifestations including trigeminal nerve ophthalmia (both 74 years old), lower body zoster (70 years old), herpes zoster oticus (17 years old), and leg herpes (28 years old), responded quickly to treatment of administration of hot water extracts of a herbal formula containing *Ganoderma lucidum*, WTMCGEP and no patient developed post-herpetic

neuralgia (PHN) after more than one year of follow-up as a result (Hijikata and Yamada, 1998).

- ) Recently, more studies demonstrated that *G. lucidum* contained antibacterial constituents that are able to inhibit gram-positive and or gram-negative bacteria. ([www.alohamedicinals.com](http://www.alohamedicinals.com))
- ) To investigate antiherpetic substances from *Ganoderma lucidum*, Eo SK *et al.*, (1999) examined various protein bound polysaccharides, GLhw, GLhw-01, GLhw-02, GLhw-03, for their antiviral activities against herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2) by plaque reduction assay in vitro. Among them, the acidic protein bound polysaccharide, GLhw-02 exhibited the most potent antiherpetic activity with 50% effective concentrations (EC50) of 300 approximately 520 microg/ml in Vero and HEp-2 cells, and its selectivity indices (SI) were more than 20. These results suggest that GLhw-02 possesses the possibility of being developed from a new antiherpetic agent.
- ) Study by Sunee *et al.*, (1992) on twenty-two HIV patients: 2 full-blown AIDS, 3 ARC (AIDS-related complex), 8 PGL (persistent generalized lymphadenopathy) and 9 asymptomatic HIV carriers revealed that *G. lucidum* extract had some immunomodulating effect on T helper cells in vitro, the effect being more pronounced on HIV-infected cells than uninfected cells.

- ) Two new lanostane-type triterpenes, lucidumol A and ganoderic acid beta were isolated from the spores of *Ganoderma lucidum*, together with a new natural one and seven that were known. Of the compound isolated, ganoderic acid beta, (24S)-lanosta-7,9(11)-diene-3 beta,24,25-triol (called lucidumol B), ganodermanondiol, ganodermanontriol and ganolucidic acid A showed significant anti-human immunodeficiency virus (anti-HIV)-1 protease activity with IC50 values of 20-90 microM (Min et al., 1998).
- ) Warts are small, generally harmless, and usually painless growths on the skin caused by a common virus in humans, the human papillomavirus (HPV). According to Jong and Birmingham (1992) for the remedy of such viral infection, Reishi mushroom (*Ganoderma lucidum*), 150 - 300 mg two to three times daily is used as antiviral and immunity activity. You may also take a tincture of this mushroom extract, 30 - 60 drops two to three times a day.
- ) A new highly oxygenated triterpene named ganoderic acid alpha has been isolated from a methanol extract of the fruiting bodies of *Ganoderma lucidum* together with twelve known compounds. Ganoderiol F and ganodermanontriol were found to be active as anti-HIV-1 agents with an inhibitory concentration of 7.8 micrograms ml<sup>-1</sup> for both, and ganoderic acid B, ganoderiol B, ganoderic acid C1, 3 beta-5 alpha-dihydroxy-6 beta-methoxyergosta-7, 22-diene, ganoderic acid alpha, ganoderic acid H and ganoderiol A were moderately active inhibitors against HIV-1 PR with a 50% inhibitory concentration of 0.17-0.23 mm (el-Mekkawy et al., 1998).
- ) *G. lucidum* has been shown to be effective in the treatment of Hepatitis B resulting in the lowering of SGPT and SCOT levels to normal, and the sero-conversion of HBs antigen to HE, antibody (Teow, 1997) *Ganoderma* extract is highly effective in improving and in most cases curing Hepatitis A, B, and C within a period of three



months. The recommended dosage is 4 capsules 3 times daily. Patients should be cured within three months.

- ) The antiviral effects of two water-soluble substances (GLhw and GLLw) and eight methanol-soluble substances (GLMe-1-8) isolated from the carpophores of *G. lucidum*, were investigated on influenza A virus strains and vesicular stomatitis virus Indiana and New Jersey in vitro. These activities were evaluated by the cytopathic effect inhibition assay and plaque reduction assay using Vero and HEp-2 cells. Five sub-stances, GLhw, GLMe-1, -2, -4, and -7 significantly inhibited the cytopathic effects of vesicular stomatitis virus. GLMe-4 did not exhibit cytotoxicity up to 1000 mg/ml, while it displayed potent antiviral activity on the vesicular stomatitis virus New Jersey strain with a therapeutic index of more than 5.43 ([www.alohamedicinals.com](http://www.alohamedicinals.com))
- ) Sebastian Cabrera noticed the warts that were on the hands have disappeared from applying *Ganoderma* toothpaste and now disappearing from the ankles. An infection in the leg healed very quickly while taking *Ganoderma*. ([www.ganoderma-online.com](http://www.ganoderma-online.com))
- ) Mrs Lakshmi,(Chennai -17) had filarial Leg for 2 yrs, filarial right leg and swelling below the knee with an ulcer. Swelling and Redness of leg reduced 50 %, feeling light with the leg in 9 days of ganotherapy Filarial leg swelling reduced by 70 % from

oozing wound stopped in about 3 months. She didn't get fever, the leg improved remarkably by 90%. ([www.geocities.com/marvellousingest/](http://www.geocities.com/marvellousingest/))

- ) In China, *Ganoderma* is widely used for the treatment of viral hepatitis, chronic bronchitis. In the US, *Ganoderma* is used in the treatment of AIDS and AIDS related conditions (El-Mekkawy and Associates, 1998)
- ) Recent work by Professor Kim, BK., (1996) of Korea, confirmed the use of Lingzhi as a valuable adjunct in the treatment of AIDS cases. In Malaysia, usage of Lingzhi as an adjunct to conventional medicine has been applied in the treatment of viral fevers, ulcers, hepatitis, and mumps.
- ) Several triterpenes from *Ganoderma lucidum* are active as antiviral agents against human immunodeficiency virus type 1 (HIV-1). The minimum concentration of ganoderiol F (6a) and ganodermanontriol (7a) for complete inhibition of HIV-1 induced cytopathic effect in MT-4 cells is  $7.8\text{-}\mu\text{g ml}^{-1}$ . Ganoderic acid B (8a) inhibits HIV-1 protease with an IC 50 value of 0.17 mM (El-Mekkawy S, et al., 1998). Ganodermediol (6b), lucidadiol (9a) and applanoxidic acid G (2c), isolated from *G. pfeifferi*, but also known from other *Ganoderma* species, possess *in vitro antiviral* activity against influenza virus type A. Further, ganodermediol (6b) is active against herpes simplex virus type 1, causing lip

exanthema and other symptoms [IC 50 in Vero cells 0.068 mmol l<sup>-1</sup> (Mothana RAA *et al.*, 2003)].

- ) Uncited sources consider lingzhi extract to be highly effective in improving and, in most cases, curing Hepatitis A, B and C within a period of 3 months. *Ganoderma* can reduce side effects like sore throat. ([www.en.wikipedia.org/wiki](http://www.en.wikipedia.org/wiki))
- ) *G. lucidum* has been portrayed as a "fix-it-all" herbal remedy for maladies such as: HIV, hepatitis A, B, and C, and mumps ([www.botit.botany.wisc.edu](http://www.botit.botany.wisc.edu))
- ) Water extract of GL has an antibacterial and anti-virus effect on pneumococcus, streptococcus, staphylococcus and influenza virus. Alcohol and acetone extract of GL also have an antibacterial effect on *Escherichia coli*, *Shigella dysenteriac* and *Bacillus*. ([www.yahwehsaliveandwell.com/reishi.html](http://www.yahwehsaliveandwell.com/reishi.html))
- ) Interferon-Inducing Activity. Interferons are a family of small protein molecules secreted naturally by human cells to fight viral and other infections. Interferon has been touted as a potential cancer-treating drug for nearly 30 years. *Ganoderma lucidum* has been found to have interferon-inducing activity ([www.arspharmae.com/articles.php?lng=en&pg=73](http://www.arspharmae.com/articles.php?lng=en&pg=73))

- ) Reishi mushroom ( *Ganoderma lucidum* ), 150 - 300 mg two to three times daily, for antiviral and immune activity. You may also take a tincture of this mushroom extract, 30 - 60 drops two to three times a day for mumps ([www.umm.edu](http://www.umm.edu))
- ) Virus-induced carcinogenesis is considered a complicated process with multiple steps involving a number of cellular signaling pathways. A few polyoxygenated lanostanoid triterpenes isolated from *G. applanatus* inhibited the 12-O-tetradecanoylphorbol-13-acetate induced Epstein–Barr virus early antigen in Raji cells. Similar effects have been observed with Zingiberaceae rhizomes, a commonly used traditional medicine in Malaysia. These results indicate that herbal medicines, such as *Ganoderma* species, may behave as antitumor promoters. ([www.alohamedicinals.com](http://www.alohamedicinals.com))

## **CHAPTER - V**

### **MATERIALS AND METHODS**

#### **5.1 Study Area:**

In Kathmandu district from Kathmandu Metropolitan basically Tinkune, New Baneshwor-12 and Battisputali-9; in Lalitpur district from Lalitpur Submetropolitan Satdobato-14, Talchhikhel-14 and Khumaltar-14 and in Kaski district from Pokhara Sub Metropolitan, Lamachaur-16 and from Lekhnath Municipality, Gagangauda-12 are preferred for the research study.

#### **5.2 Study Population:**

The people of Kathmandu, Lalitpur and Kaski districts were taken into account for the study. This study has included 100 *Ganoderma* consumers as subjects, 30 from Kathmandu, 40 from Lalitpur and 30 from Kaski districts. Sex, specific caste and age group etc were not considered separately for this study due to the very limited number of consumers of *Ganoderma* for microbial infections.

To assess the knowledge, attitude and practice of *Ganoderma* in the control and prevention of microbial infections, a different study population from the same study area comprising of 100 subjects were considered for study.

#### **5.3 Research design:**

The present study is mainly focused on obtaining the data to determine the role of *Ganoderma* in the control and

prevention of microbial infection. Thus due to the nature of the study, the researcher applied the descriptive method of research by which the data was collected and analyzed. The most commonly used survey method was used in three districts viz, Kathmandu, Lalitpur and Kaski.

#### **5.4 Sample size:**

This study has included 100 *Ganoderma* consumers as subjects, 30 from Kathmandu, 40 from Lalitpur and 30 from Kaski and 100 non consumers ie, 40 from Kaski and 30 each from Kathmandu and Lalitpur districts for the study of public awareness about *Ganoderma* and ganotherapy in the control and prevention of diseases.

#### **5.5 Sources of Data:**

The data for the present study was collected from people of Kathmandu, Lalitpur and Kaski district who were the consumers of *Ganoderma* products.

#### **5.6 Sampling Procedure (Method)**

The researcher applied simple random sampling method to select the required number of subjects from the three different districts as a sample of study for the collection of primary data.

#### **5.7 Research instruments and Tools:**

The research is based on the primary data as well as secondary data that have been collected from various sources. Secondary data were collected via books and booklets, research center documents, company profiles, DXN training center documents, journals internet etc. Primary data were collected through the following tools:

- (a) Household survey using technique of questionnaire
- (b) Observation and group discussion
- (c) Personal interview
- (d) People participatory approach

A set of questionnaire having open and closed ended questions were used (Appendix-A) in order to collect the information regarding the health problem, type of medical treatment, result of medication, result of ganotherapy, form of *Ganoderma* used etc. The questionnaire was developed under the consultation and guidance of research supervisor, members of Research Committee and the experts in these concerned field of ganotherapy.

#### **5.8 Data Collection Procedure:**

Since it was very difficult to know the people who are using *Ganoderma* products for their health problem and to get access to them by personal contact was even more difficult, the researcher planned to visit Sanjeevani Clinic and research center Thamel, Kathmandu on DXN training days which normally takes place on Saturdays once or twice in a month. The trainees were primarily regular *Ganoderma* consumers. With the short introduction the respondents were oriented with the purpose of filling up the questionnaire as per given instructions. The same procedure was followed in DXN center Pokhara to collect the primary data of subjects of Kaski district. In Lalitpur these data were collected from New Bibek Enterprises Pvt.Ltd. when these consumers visited it to purchase the *Ganoderma* products. In some cases the researcher made personal contact with the respondents to collect the primary data.

## CHAPTER - VI

### RESULTS

For the systematic presentation, the analysis and interpretations are categorized into the following sections.

1. Effects of various aspects of *Ganoderma* on various health problems as a whole in general.
2. Effects of various aspects of *Ganoderma* specifically on microbial infections.
3. Comparison of Ganotherapy with other modes of medication.
4. Public awareness about *Ganoderma* and ganotherapy.



## 6.1 GANOTHERAPY ADOPTED FOR VARIOUS HEALTH PROBLEMS

The health problems for which ganotherapy is basically adopted by the subjects of the study area are compiled in Table-1

**Table-1: Ganotherapy Adopted For Various Health Problems**

S.N	Districts	Lalitpu	Kathman	Kask	Total	
		No.	No.	No.	No	%
1	Gastritis	2	4	4	10	6.4
2	Lethargy	1	1	0	2	1.3
3	Skin disease	10	3	0	13	8.3
4	Sinusitis	4	5	2	11	7.0
5	Hypertension	0	4	0	4	2.5
6	Heart problem	1	0	1	2	1.3
7	Insomnia	1	1	0	2	1.3
8	Indigestion	3	1	1	5	3.1
9	Chest pain	1	1	0	2	1.3
10	Acne/pimples	3	1	1	5	3.1
11	Nerve problem	1	1	0	2	1.3
12	Tetanus	0	1	0	1	0.6
13	Typhoid fever	0	0	1	1	0.6
14	Paralysis	0	0	2	2	1.3

15	Asthma	4	5	1	10	6.4
16	Common cold	12	16	2	30	19.1
17	Menstrual cycle disorder	1	1	0	2	1.3
18	Loss of appetite	3	9	2	14	8.8
19	Back pain	3	0	0	3	2.0
20	Arthritis	6	3	3	12	7.6
21	Stomach pain	1	2	0	3	2.0
22	Tonsillitis	0	1	0	1	0.6
23	Viral fever	1	0	2	3	2.0
24	Dental caries	2	0	4	6	3.8
25	Warts	1	1	0	2	1.3
26	Anaemia	1	1	0	2	1.3
27	Measles	1	0	0	1	0.6
28	Limb problem	2	4	0	6	3.8
	<b>Total</b>	<b>65</b>	<b>66</b>	<b>26</b>	<b>157</b>	<b>100</b>

From the table-1, it is obvious that ganotherapy is adopted for a wide range of health problems including microbial and non-microbial health conditions. The data exhibits the adoption of ganotherapy commonly for health disorders such as gastritis, skin diseases, sinusitis, asthma, common cold, loss of appetite, arthritis etc. This data hence predicts the versatility of *Ganoderma* for various ailments and the public faith on this miraculous and magical herb. Probably that is why various titles have been imparted to

*Ganoderma* as “Universal Medicine, Gods Herb, Kaliyug ko Sanjeevani Buti, A-One Medicine, Herb of good fortune” etc.

Although the sample size taken for the study is 100, since the same individual is found to adopt ganotherapy for more than one health problems the sample size has exceeded 100 to make the total number 157.

### **6.1.1 EFFECTIVENESS OF GANOTHERAPY ON VARIOUS AILMENTS**

To explore the effectiveness of ganotherapy for various ailments a question having four options was asked to the respondents. The responses thus collected were grouped, calculated in percentage and presented in table-2 for explanation.

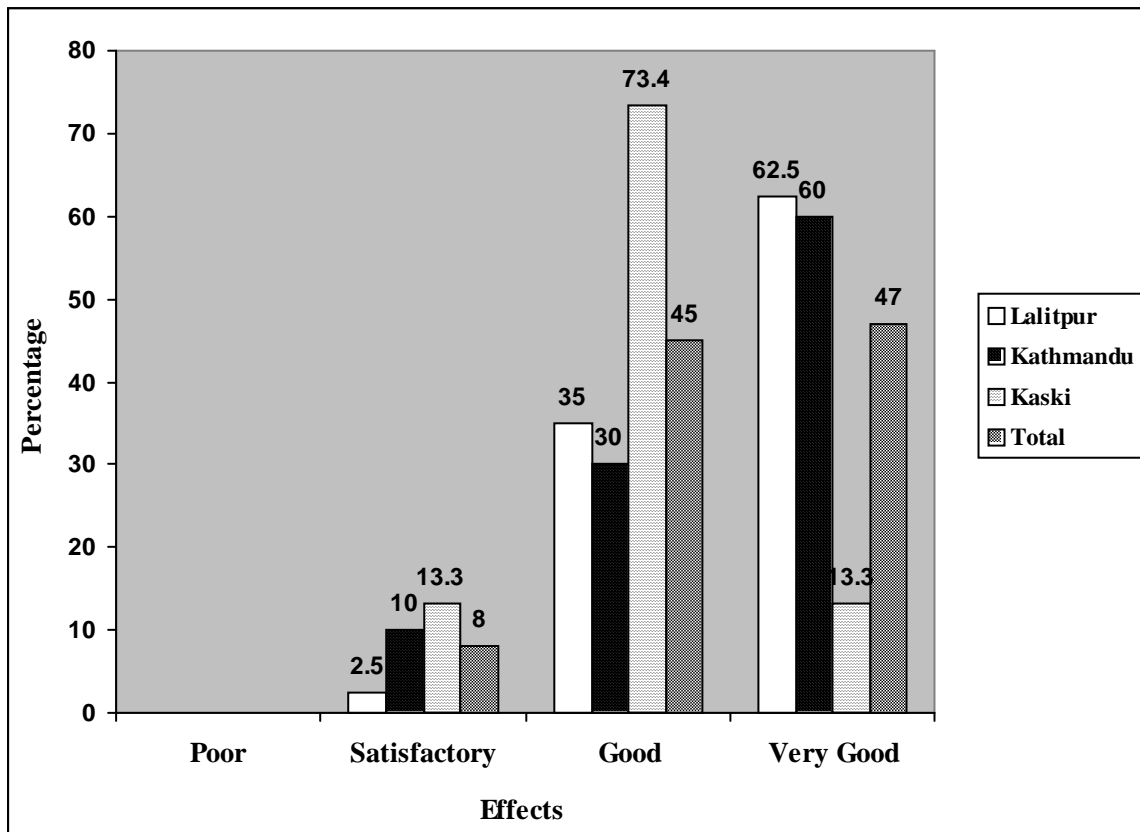
**Table-2: Effectiveness Of Ganotherapy On Various Ailments**

<b>Districts</b>	<b>Lalitpur</b>		<b>Kathmand</b>		<b>Kaski</b>		<b>Total</b>	
	<b>No</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>
Poor	0	0	0	0	0	0	0	0
Satisfactory	1	2.5	3	10	4	13.3	8	8
Good	14	35.0	9	30	22	73.4	45	45
Very Good	25	62.5	18	60	4	13.3	47	47
<b>Total</b>	<b>40</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>100</b>	<b>100</b>

The district wise analysis of the effects of ganotherapy on various health problems, revealed from table-2 has depicted that Lalitpur has the highest percentage (62.5%) of very good result, Kathmandu with 60% of very good result but Kaski has the highest percentage (73%) of good result. However in overall 47% cases have very good results, 45% with good results and only 8% with satisfactory result. It is

interesting to note that not a single case (0%) had a poor result

From the high percentage of very good (47%) and good (45%) result of ganotherapy, it is predictable that *Ganoderma* may have great pharmaceutical value for a wide range of health problems.



**Figure No-1: Bar diagram illustrating Effectiveness Of Ganotherapy On Various Ailments**

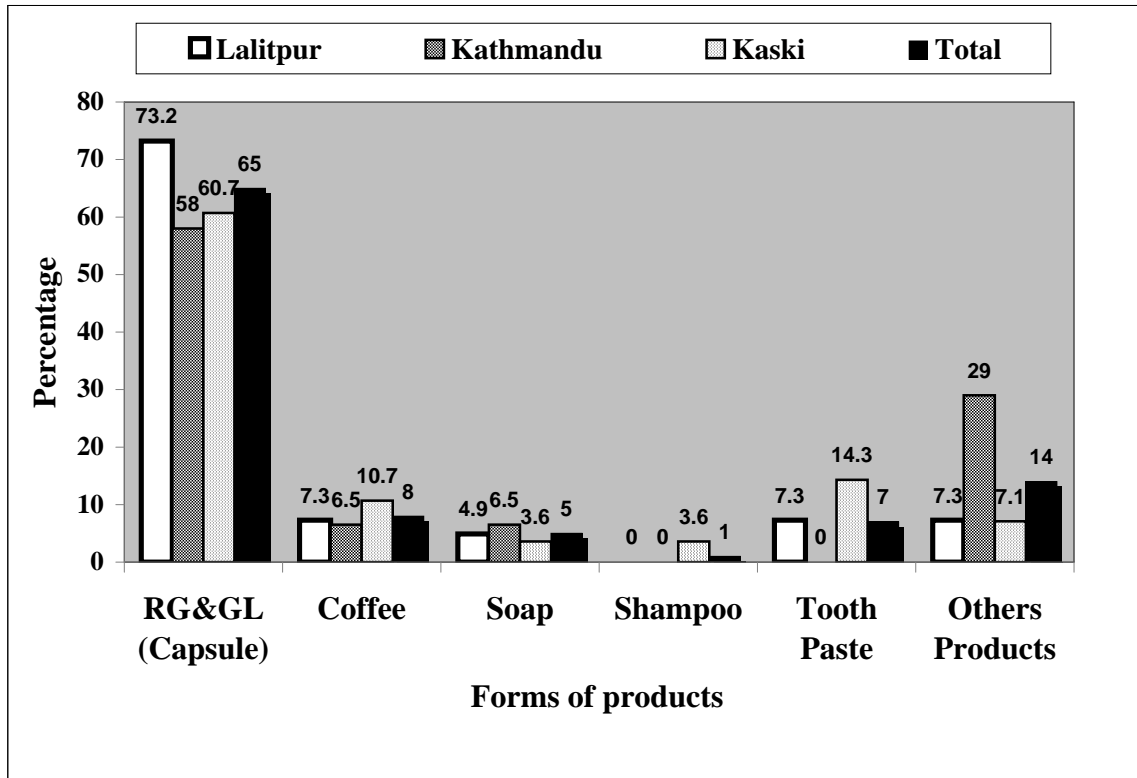
### **6.1.2 VARIOUS FORMS OF GANODERMA USED BY CONSUMERS FOR VARIOUS HEALTH PROBLEMS**

*Ganoderma* is used in various products such as beverages, cosmetics, in the form of capsule etc so that it can be made available to the consumers in the form they desire to have it to meet their needs which are available basically in the forms as described in chapter III ( p12-14).

Table 3 shows the forms of *Ganoderma* products used by the respondents for the remedy of the various health conditions

#### **Table-3: Various Forms Of *Ganoderma* Used By Consumers For Various Health Problems**

The table 3 reveals that in Lalitpur out of 41 consumers 30 (73.2 %) have been found to use RG & GL capsule. Similarly in Kathmandu and Kaski the capsule consumers are 18 (58.0%) and 17 (60.7%) respectively. On the whole RG & GL consumers are 65.0 %. On the contrary other products are used in relatively lesser extent.



**Figure No-2: Bar diagram illustrating Various Forms of *Ganoderma* used by Consumers for Various Health Problems.**

The reasons for the relatively high consumption of RG & GL capsule by the consumers may be due to the variation in the proportion of *Ganoderma* in the various products i.e., the RG & GL capsule have 100 % *Ganoderma* and is highly effective against many ailments than other products. Hence RG & GL capsules are used in a large scale by a large number of people. On the contrary other products have relatively much less proportion of *Ganoderma* and are not as versatile and effective as RG & GL capsule to be used for a wide range of diseases. Hence these products have been used by fairly limited number of people.



## **6.2 ADOPTION OF GANOTHERAPY FOR MICROBIAL INFECTIONS IN GENERAL**

Various studies on Lingzhi (*Ganoderma*) has indicated its antimicrobial applications i.e., its antibacterial and antiviral actions. It reduces the duration and severity of dengue fever, the size and severity of the lesion and pain were greatly reduced in the case of herpes genitals, mumps too responded favourably, ie, pain and swelling were reduced. However with herpes zoster and chicken pox, Lingzhi had to be started at the onset to get the best results. Lingzhi has been used for the treatment of throat infections, acts as anti HIV action, anti viral actions such as influenza, Hepatitis A, B and C and filaria etc.

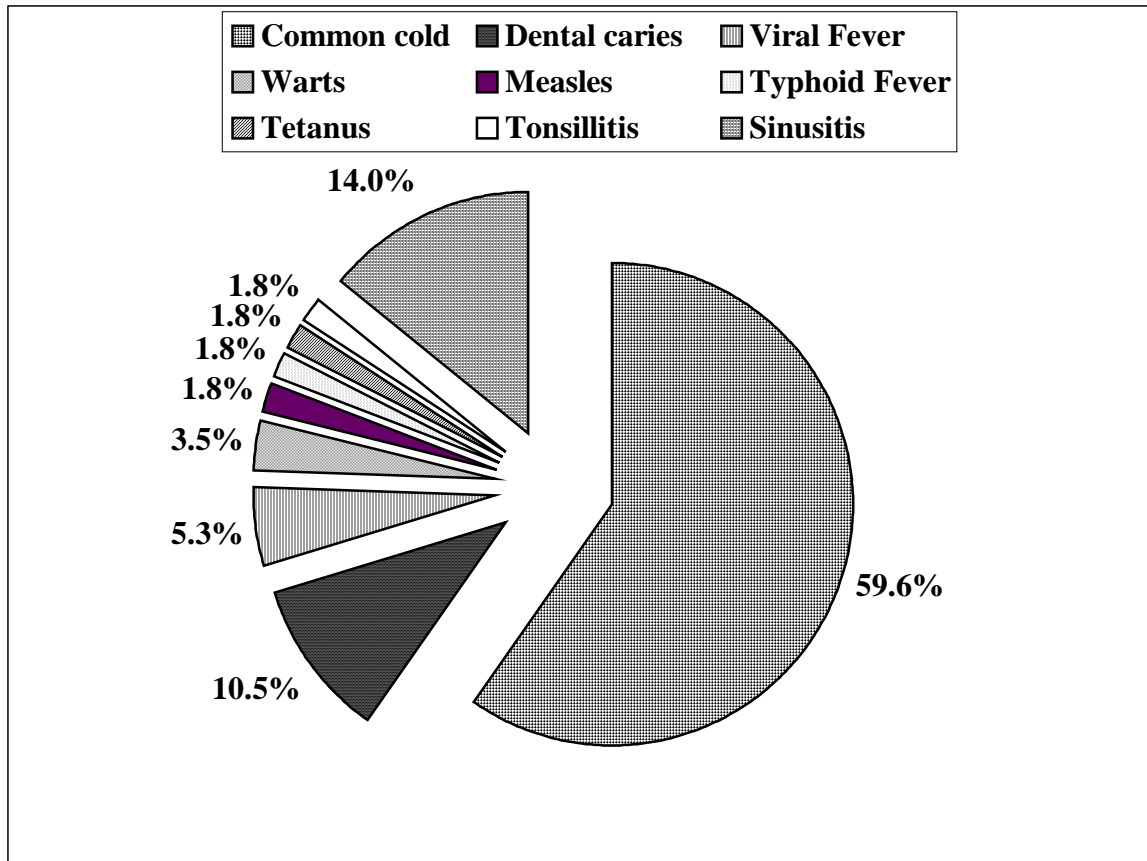
In the light of the above information a question was asked to the respondents to investigate whether they adopted ganotherapy for the control and prevention of microbial infections. Their responses thus collected were grouped, calculated in percentage in Table 4 for explanation

**Table-4: Adoption Of Ganotherapy For Microbial Infections In General**

	District					
		No	No	No	No	%
1	Common cold	16	16	2	34	59.6
2	Dental caries	2	0	4	6	10.5
3	Viral Fever	1	0	2	3	5.2
4	Warts	1	1	0	2	3.5
5	Measles	1	0	0	1	1.8
6	Typhoid Fever	0	0	1	1	1.8
7	Tetanus	0	1	0	1	1.8
8	Tonsillitis	0	1	0	1	1.8
9	Sinusitis	1	5	2	8	14.0
	<b>Total</b>	<b>22</b>	<b>24</b>	<b>11</b>	<b>57</b>	<b>100</b>

The study revealed that ganotherapy is adopted for a number of microbial infections as listed in table-4. It has revealed that the adoption of ganotherapy against microbial infections is very limited i.e. it is not found very encouraging.

However out of 57 microbial cases 59% (34) cases are recorded merely for common cold, 10.5% (6) for dental caries, 5.2% (3) for viral fever, 3.5% (2) for warts, 14% (8) for sinusitis and rest for other cases. The result obviously depicts that ganotherapy is confined basically to antiviral and antibacterial applications. Excluding common cold, other microbial cases are greatly limited within a narrow range of 1 to 8 in number.



**Figure No-3: Pie Chart illustrating Adoption of Ganotherapy for Microbial Infections in General**

### **6.2.1 ADOPTION OF GANTHERAPY FOR VIRAL AND BACTERIAL INFECTIONS**

A comparative study of the adoption of ganotherapy for the specific bacterial and viral diseases reveal the following results.

**Table-5: Adoption Of Ganotherapy For Viral And Bacterial Infections**

Districts		Lalitpur	Kathmandu	Kaski	Total	
		No.	No.	No.	No.	%
Viral	Common cold	16	16	2	34	<b>84.2 %</b>
	Sinusitis	1	5	2	8	
	Viral Fever	1	0	2	3	
	Warts	1	1	0	2	
	Measles	1	0	0	1	
<b>Total</b>		<b>20</b>	<b>22</b>	<b>6</b>	<b>48</b>	
Bacterial	Typhoid	0	0	1	1	<b>15.8 %</b>
	Tetanus	0	1	0	1	
	Tonsillitis	0	1	0	1	
	Dental	2	0	4	6	
<b>Total</b>		<b>2</b>	<b>2</b>	<b>5</b>	<b>9</b>	<b>100 %</b>

The Table 5 portrays the adoption of ganotherapy for majority of viral cases, ie, 48 cases (84.2 %). On the other hand relatively few bacterial cases, i.e., 9 cases (15.8 %) are observed to adopt ganotherapy. We can most probably attribute the greater prevalence of viral diseases in the study population for the greater ratio of the adoption of ganotherapy for viral cases of the infection/disease than bacterial diseases.

## **6.2.2 EFFECTIVENESS OF GANOTHERAPY ON MICROBIAL INFECTIONS IN GENERAL**

To explore the effectiveness of ganotherapy on microbial infections, a question with four associated options was asked to the subjects and their responses are exhibited in Table-6 for interpretation.

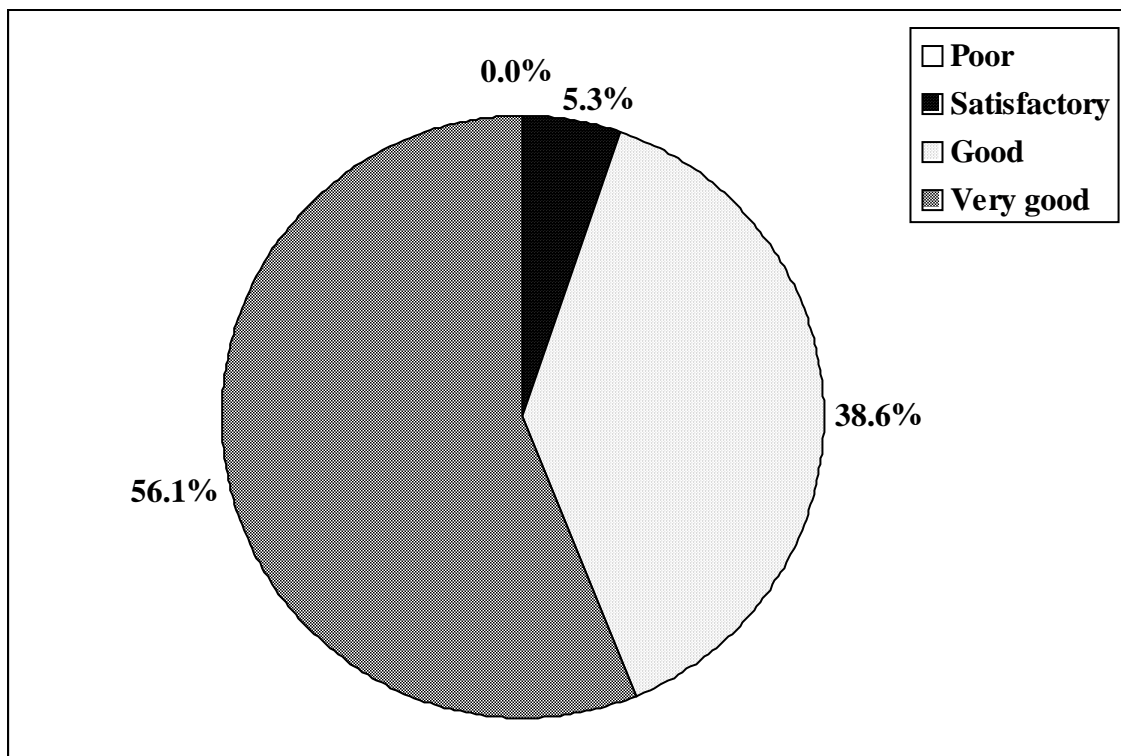
**Table-6: Effectiveness Of Ganotherapy On Microbial Infections In General**

<b>Districts</b>	<b>Lalitpur</b>	<b>Kathmandu</b>	<b>Kaski</b>	<b>Total</b>	
	<b>No.</b>	<b>No.</b>	<b>No.</b>	<b>No.</b>	<b>%</b>
Poor	0	0	0	0	0
Satisfactory	1	2	0	3	5.3
Good	9	5	8	22	38.6
Very good	12	17	3	32	56.1
<b>Total</b>	<b>22</b>	<b>24</b>	<b>11</b>	<b>57</b>	<b>100</b>

The table depicts that out of 57 respondents, 56.1% (32) results were observed very good, 38.6 % (22) results good and 5.3 % (3) results satisfactory but not a single case (0%) of poor result to observe.

While analyzing the district wise data, the similar trends can be noticed except Kaski district. The analysis of results of ganotherapy expresses its very obvious positive effect against microbial infections. This may be because

*Ganoderma* contains bioactive polysaccharides, which have been shown to have a marked antimicrobial activity.



**Figure No-4: Pie Chart illustrating Effectiveness of Ganotherapy on Microbial Infections in General**

### 6.2.3 EFFECT OF GANODERMA ON SPECIFIC MICROBIAL INFECTIONS

To explore the effect of *Ganoderma* on specific microbial infection a question having four options was asked to the respondents. The information thus collected was grouped, calculated in percentage and presented in table 7 for explanation.

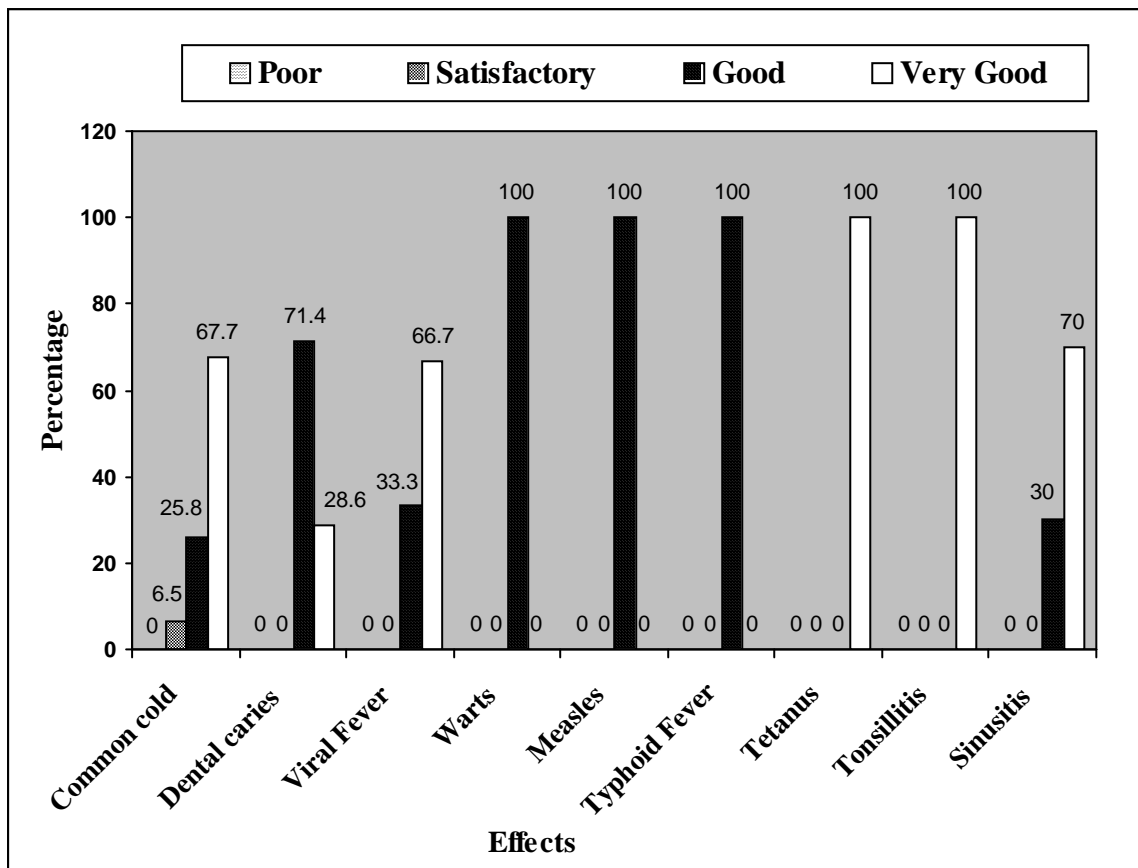
Table-7: Effect Of *Ganoderma* On Specific Microbial Infections

Effects Microbial									No.
	No	%	No	%	No	%	No	%	
Common cold	0	0	2	6.5	8	25.8	21	67.7	31
Dental caries	0	0	0	0	5	71.4	2	28.6	7

Viral Fever	0	0	0	0	1	33.3	2	66.7	3
Warts	0	0	0	0	2	100	0	0.0	2
Measles	0	0	0	0	1	100	0	0.0	1
Typhoid Fever	0	0	0	0	1	100	0	0.0	1
Tetanus	0	0	0	0	0	0	1	100	1
Tonsillitis	0	0	0	0	0	0	2	100	2
Sinusitis	0	0	0	0	3	30	7	70.0	10

The table portrays that in all cases of the infections listed, basically good and very good results are observed. Significantly higher percentage (above 65 %) of very good results is observed in the cases of common cold, sinusitis, viral fever, tonsillitis and tetanus. However *Ganoderma* seems to be effective against other microbial infections as well i.e. dental caries warts, measles etc.





**Figure No-5: Bar diagram illustrating Effect of *Ganoderma* On Specific Microbial Infections**

## 6.2.4 COMPARISON OF ADOPTION OF GANOTHERAPY FOR MICROBIAL AND NON MICROBIAL INFECTIONS

To find out whether the consumers commonly used *Ganoderma* products for microbial infections or non-microbial infections, a comparison was done on the basis of the previously collected data, which is as follows

**Table – 8: Comparison Of Adoption Of Ganotherapy For Microbial And Non-Microbial Infections**

S.N	Non microbial infections	Districts	Lalitpur	Kathmandu	Kaski	Total	
			No.	No.	No.	No	%
1	Gastritis		2	4	4	10	65.7
2	Lethargy		1	1	0	2	
3	Skin disease		10	5	0	15	
4	Sinusitis		1	2	0	3	
5	Hypertension		0	4	0	4	
6	Heart problem		1	0	1	2	
7	Insomnia		1	1	0	2	
8	Indigestion		3	1	1	5	
9	Chest pain		1	1	0	2	
10	Acne/pimples		3	1	1	5	
11	Nerve problem		1	1	0	2	
12	Tetanus		0	1	0	1	
13	Typhoid fever		0	0	1	1	
14	Paralysis		0	0	2	2	
15	Asthma		4	5	1	10	
16	Menstrual cycle disorder		1	1	0	2	
17	Loss of appetite		3	10	2	15	
18	Back pain		3	0	0	3	
19	Arthritis		6	3	3	12	
20	Stomach pain		1	2	0	3	
21	Anemia		1	1	0	2	
22	Limb problem		2	4	0	6	
	<b>Total</b>		<b>45</b>	<b>48</b>	<b>16</b>	<b>109</b>	
SN	Microbial infections	Districts	Lalitpur	Kathmandu	Kaski	Total	
			No.	No.	No.	No.	%
1	Common cold		16	16	2	34	34.3
2	Dental caries		2	0	4	6	
3	Viral Fever		1	0	2	3	
4	Warts		1	1	0	2	
5	Measles		1	0	0	1	
6	Typhoid Fever		0	0	1	1	
7	Tetanus		0	1	0	1	
8	Tonsillitis		0	1	0	1	

9	Sinusitis	1	5	2	8	
	<b>Total</b>	<b>22</b>	<b>24</b>	<b>11</b>	<b>57</b>	
	<b>Grand total</b>	<b>67</b>	<b>72</b>	<b>27</b>	<b>166</b>	

While analyzing the ratio of adoption of ganotherapy for microbial and non microbial health conditions, it is observed from the table-8 that 65.7 % of the respondents adopted ganotherapy for non microbial cases of the diseases whereas 34.3 % of them adopted the same for microbial infections. Thus, relatively cases of microbial aspects are not found very encouraging.

Ganotherapy being relatively more expensive mode of medication may possibly be one of the prime reasons for this. Since there are other cheaper means of treatments or cure for microbial infections, patients are perhaps reluctant to expend more on ganotherapy in spite of its extremely broad health benefits.

### 6.2.5 CAUSES OF ADOPTING GANOTHERAPY FOR MICROBIAL INFECTIONS

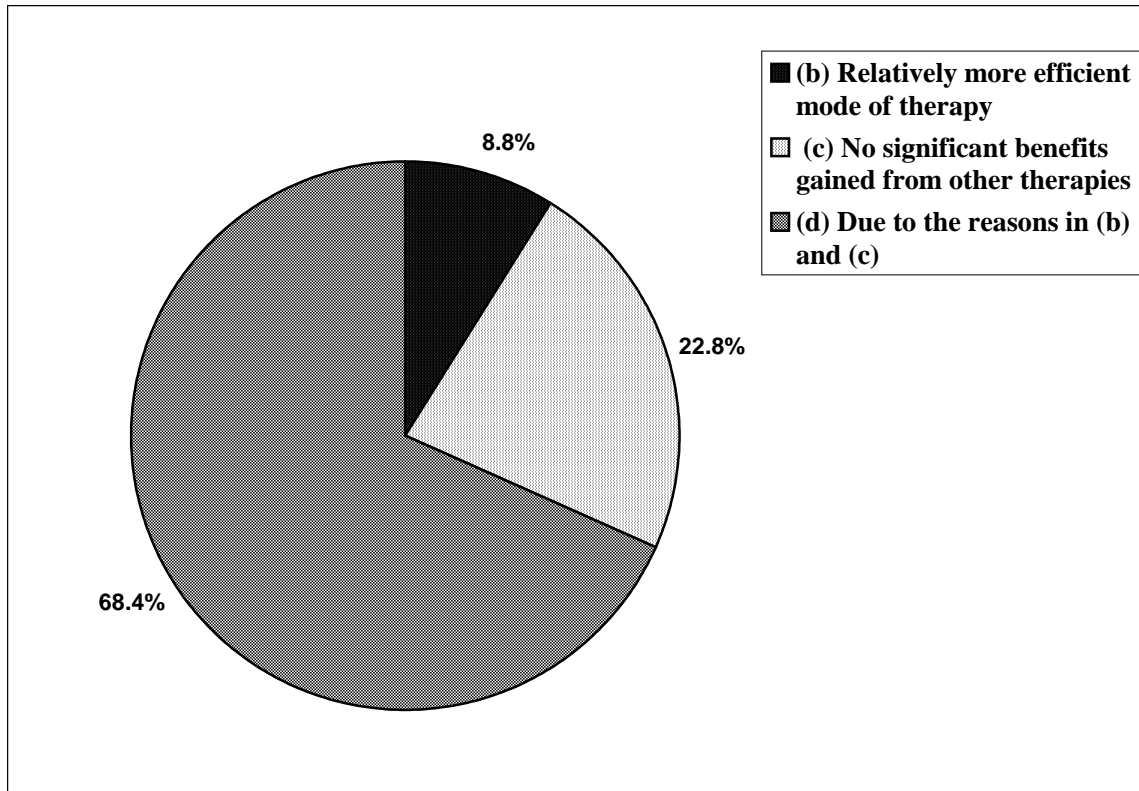
In our practical life there are many things that we have to do for running life. For each action that we undertake there is a specific reason behind it. In this context the researcher had asked the respondents a question what the reason was for them not to adopt other therapies but ganotherapy for the microbial diseases. Their responses are displayed in table 9 for explanation.

**Table-9: Causes Of Adopting Ganotherapy For Microbial Diseases**

<b>Districts</b>	<b>No.</b>	<b>Kathmandu</b>	<b>Kask</b>	<b>Total</b>	
		<b>No.</b>	<b>No.</b>	<b>No.</b>	<b>%</b>
(a) Readily available and affordable mode of therapy	0	0	0	0	0
(b) Relatively more efficient mode of	2	3	0	5	8.8

therapy					
(c) No significant benefits gained from other therapies	4	6	3	13	22.8
(d) Due to the reasons in (b) and (c)	16	15	8	39	68.4
<b>Total</b>	<b>22</b>	<b>24</b>	<b>11</b>	<b>57</b>	<b>100</b>

From table 9 it is evident that ganotherapy is not readily available mode of therapy nor it is readily affordable. In fact the availability of *Ganoderma* is very limited and its access to the general public is also of course limited due to its relatively higher cost. The result depicts the adoption of ganotherapy by the people for the health problems enlisted due to its higher efficacy and the unsatisfactory effects of other therapies.



**Figure No-6: Pie Chart illustrating Causes of Adopting Ganotherapy for Microbial Infections**

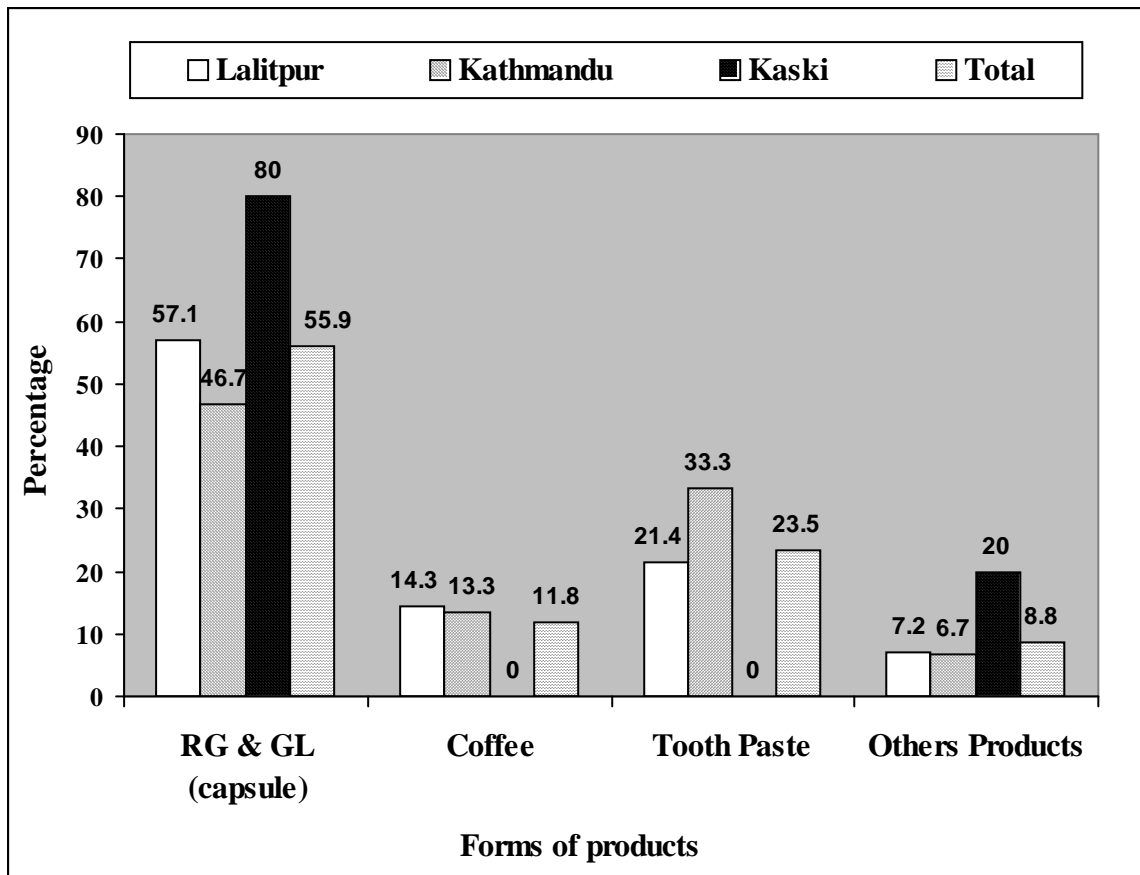
## 6.2.6 VARIOUS FORMS OF GANODERMA USED BY CONSUMERS FOR MICROBIAL INFECTIONS

To explore the forms of *Ganoderma* products used by the consumers for the remedy of microbial diseases, a question with four options was asked to the respondents and their responses are presented in the table for interpretation.

### **Table-10 : Various Forms Of *Ganoderma* Used By Consumers For Microbial Infections**

The table 10 reveals that in Lalitpur out of 14 consumers 8 (57.1 %) have been found to use RG & GL capsule. Similarly in Kathmandu and Kaski the capsule consumers are 7 (46.7 %) and 4 (80 %) respectively. On the whole RG & GL consumers are 55.9 %. The RG & GL capsule have 100 % *Ganoderma* and is highly effective against a wide range of microbial infections. Hence the consumers use RG & GL capsules in relatively larger scale.

On the contrary other products have relatively much lesser proportion of *Ganoderma* and are not as versatile and effective as RG & GL capsule to be used for a wide range of diseases. Hence these products have been used by fairly limited number of people.



**Figure No-7: Bar diagram illustrating Various Forms of *Ganoderma* Used by Consumers for Microbial Infections.**



### **6.3 RESPONDENTS' OPINION ABOUT THE BEST MODE OF MEDICATION FOR THE REMEDY OF VARIOUS HEALTH HAZARDS**

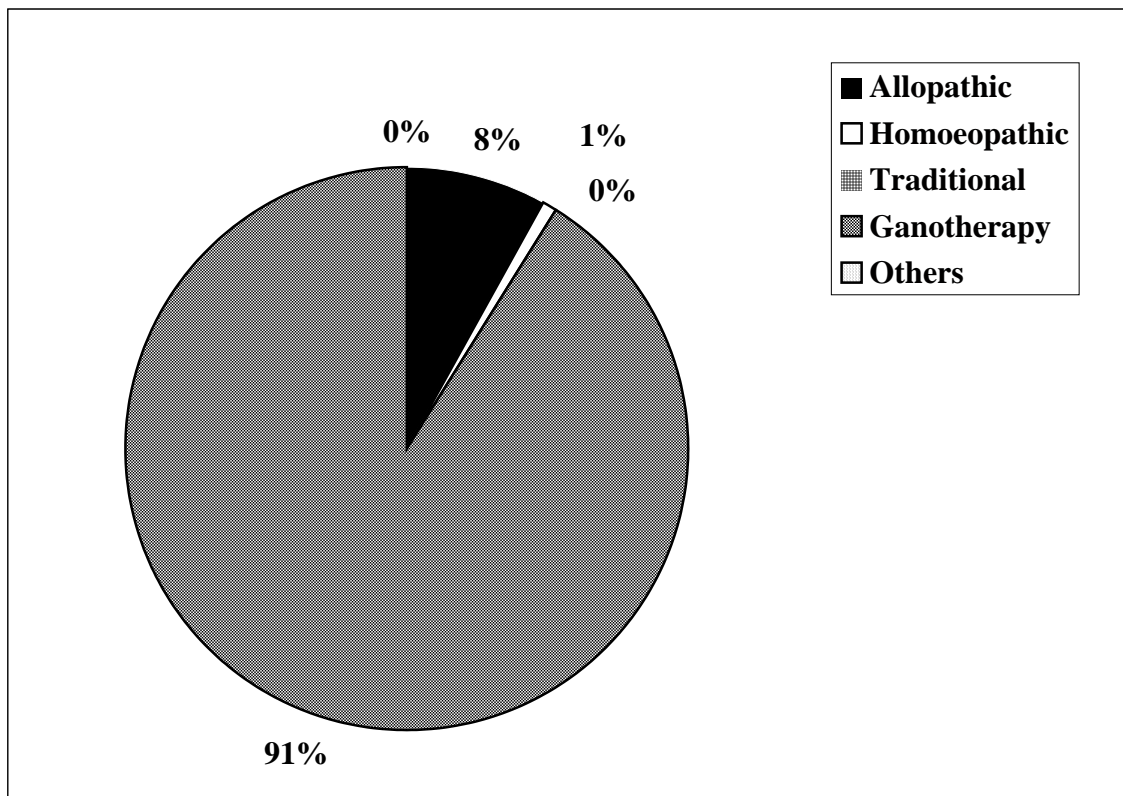
Human beings are conscious creature of nature and as a conscious being he has the value and beliefs of things and activities. He looks anxious towards his health. So his activities are always directed towards health. This theory is also adhering to the selection of best medication for a sound health. Depending on various factors such as type and nature of illness, social and economic status of individuals and their access to a particular type of medication and its effectiveness, people adopt medication of their own choice, which is suitable, effective and accessible to them. In such a context a survey on consumers choice of medication was carried out and the results are presented in table-11 for analysis.

**Table–11: Respondents' Opinion About The Best Mode Of Medication For Various Health Problems**

While analyzing the best mode of medication of respondents' choice, relatively very high percentage (91%) of the study population is found to have immense faith in ganotherapy followed by 8% in allopathic, 1% in homoeopathic and 0% in others. While analyzing the district wise data the similar trends can be observed.

The reasons for such a sincere appreciation of ganotherapy shown by the consumers may be that *Ganoderma* since it is recommended as a general tonic, practically relieves all kinds of diseases, hence entitled as "Sarvaroga nivarani". It is also an immune modulator i.e.

regulates and fine tunes the immune system, has no side effects of its own, but helps to eliminate side effects caused by chemotherapy. It has broad efficacy and is a suitable therapy for all age group.



**Figure No-8: Pie Chart illustrating Respondents' Opinion about the Best Mode Of Medication for the Remedy of Various Health Hazards.**

#### **6.4 PUBLIC AWARENESS ABOUT GANODERMA AND GANOTHERAPY**

Awareness of aspects such as social, economic, cultural, physical etc is a prerequisite for the overall development and success of an individual, society and nation as a whole. For this nature has gifted the living creatures of this earth with enormous, unique and precious natural jewels. It is wise to make the best use of these valuable gifts of nature and take immense benefits from them. Human is considered as the most successful and dominant species and occupies a special position in the living world. Being such superior species, is man in fact aware of nature's such valuable treasure and has he been able to achieve the broad range of benefits out of it?

For thousands of years, Lingzhi (*Ganoderma*) has been considered by the Chinese to be high quality herbal medicine, so called "A-one Medicine" which has been used in China and Japan for over 2000 years. A considerable number of studies in Japan, China, USA and the UK in the past 30 years have shown that the consumption of Lingzhi has been linked to the treatment of a vast range of diseases including a number of microbial infections.

But has this miraculous herb gained any position at all in Nepal? Have people even heard of this magical herb? If

yes, how much knowledge do they have about *Ganoderma* and ganotherapy? With the intention to get the idea of public awareness about this magical herb, the researcher carried out a survey through a questionnaire. 100 non consumers of *Ganoderma* from the same study area were considered i.e. 40 from Kaski, 30 each from Kathmandu and Lalitpur districts were taken into account for the study The public responses of the question “how much knowledge do you have about *Ganderma* and ganotherapy?” were collected, grouped, calculated in percentage and presented in table-12 for its explanation.

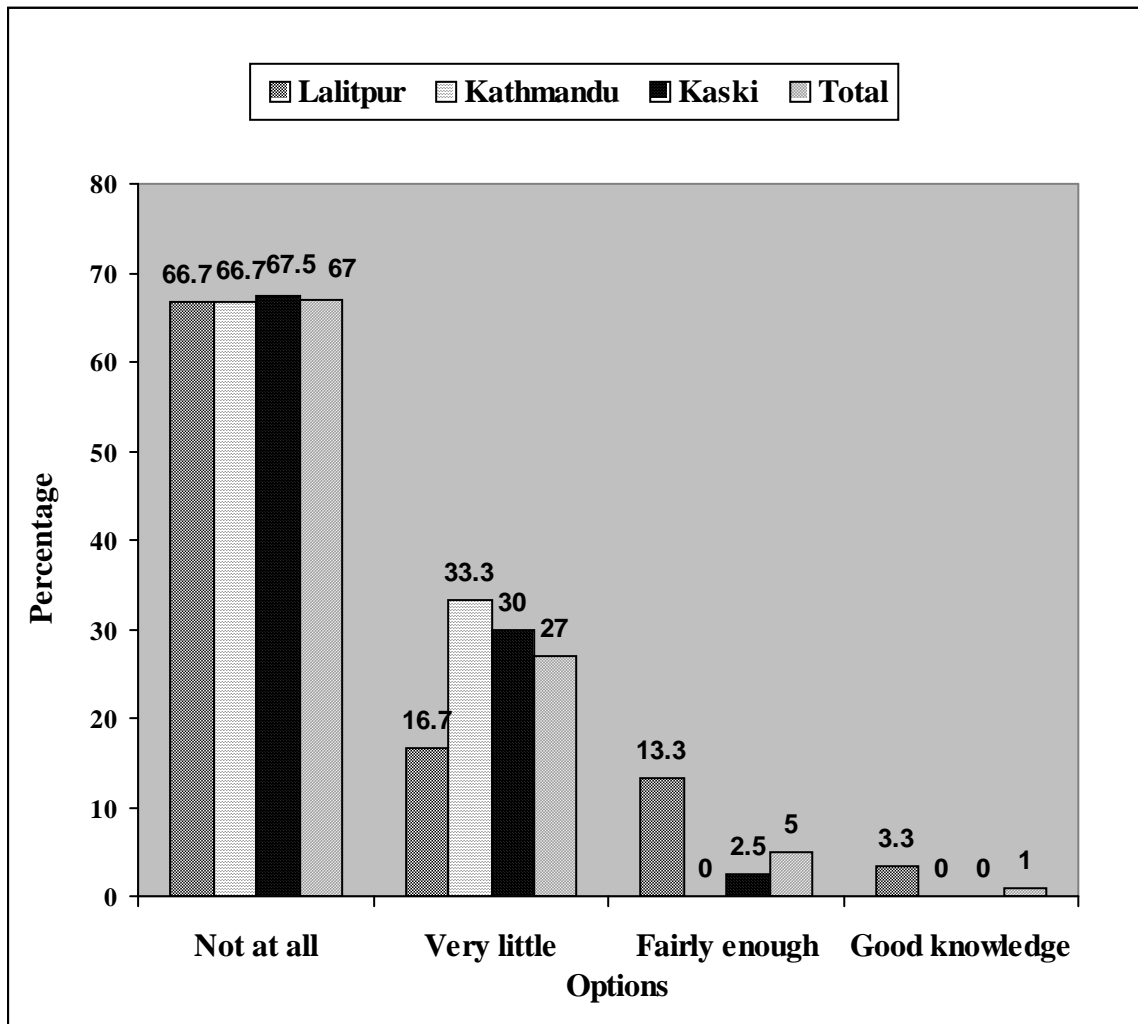
**Table–12: Public Awareness About *Ganoderma* And Ganotherapy**

<b>District</b>	<b>Lalitpur</b>		<b>Kathmand</b>		<b>Kaski</b>		<b>Total</b>	
	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No</b>	<b>%</b>
Not at all	20	66. 7	20	66.7	27	67.5	67	67

Very little	5	16.7	10	33.3	12	30.0	27	27
Fairly enough	4	13.3	0	0	1	2.5	5	5
Good knowledge	1	3.3	0	0	0	0	1	1
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>40</b>	<b>100</b>	<b>10</b>	<b>10</b>
							<b>0</b>	<b>0</b>

It is revealed from table-12 that 67 % of the subjects had known nothing at all about *Ganoderma* and ganotherapy, whereas 27 % and 5 % people had known very little and fairly enough about it respectively. Similarly the people who had good knowledge about *Ganoderma* and Ganotherapy were only 1 %.

Although the introduction and practice of ganotherapy in the global context has a long history, since the same in the context of Nepal is at its preliminary stage and the limited supply and distribution of *Ganoderma* products from only the limited number of DXN centres of Nepal possibly are what attribute for the ignorance and unawareness about *Ganoderma* and ganotherapy among Nepalese population. And also since *Ganoderma* products are most probably unaffordable and inaccessible to the general public they perhaps exhibit little concern and care for *Ganoderma* in spite of its immense health benefits which might have led to its ignorance and unawareness.



**Figure No-9: Bar diagram illustrating Public Awareness about *Ganoderma* and Ganotherapy.**

#### 6.4.1 AWARENESS OF GANODERMA AND GANOTHERAPY AMONG SLC AND ABOVE SLC GRADUATES

Obviously education has a direct or indirect impact on all aspects of development. without which it is almost impossible to achieve success. Basically literate and highly qualified people have more knowledge and awareness about certain aspect than illiterate and less qualified people. To explore the awareness of *Ganoderma* and its therapy among SLC and above SLC graduates a question having four options was asked to the respondents. The information thus collected were grouped, calculated in percentage and presented in table 13 for the explanation.

**Table-13: Awareness Of *Ganoderma* And Ganotherapy Among SLC And Above SLC Graduates**

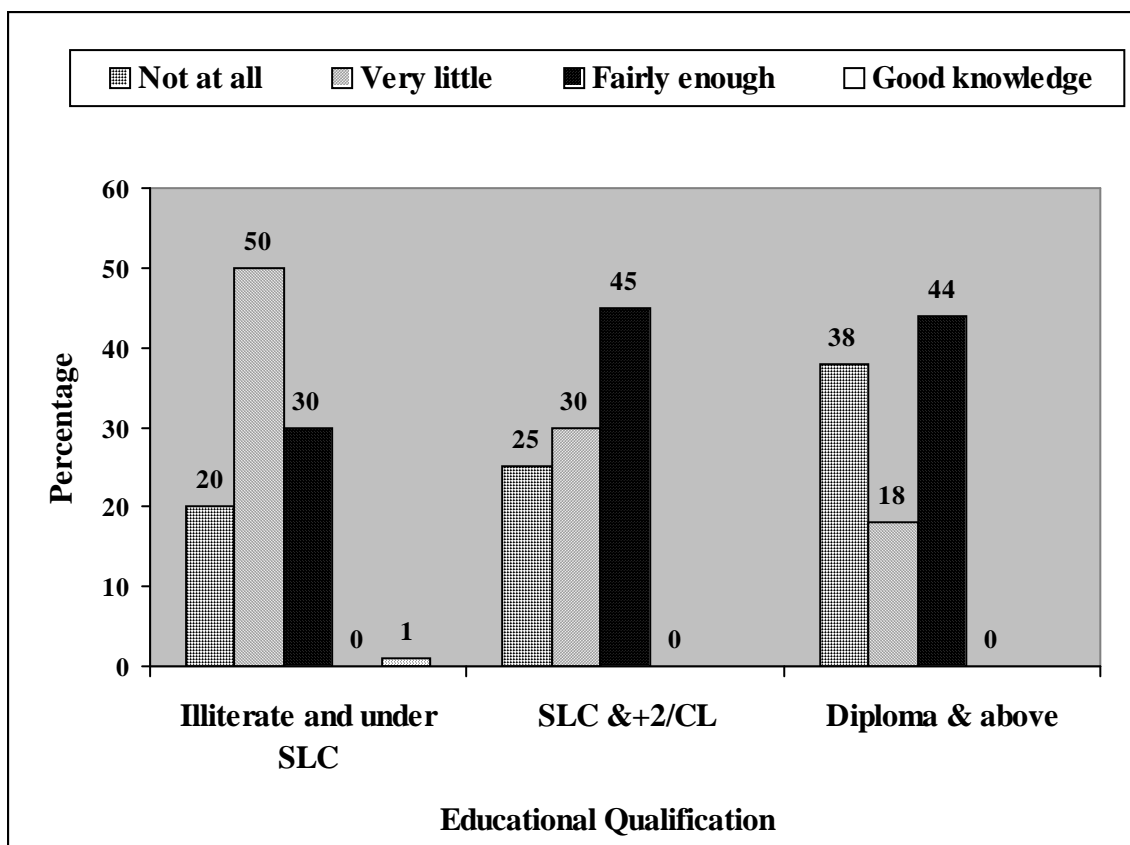
Knowledge	Not at		Very		Fairly		Good		Total	
	No	%	No	%	N	%	No	%	No.	%
Illiterate and under SLC	6	20	15	50	9	30	0	0	30	100
<b>Total</b>	<b>6</b>	<b>20</b>	<b>15</b>	<b>50</b>	<b>9</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>100</b>
SLC & +2/CL	5	25	6	30	9	45	0	0	20	100
Diploma & above	19	38	9	18	22	44	0	0	50	100

<b>Total</b>	<b>24</b>	<b>34.</b>	<b>15</b>	<b>21.</b>	<b>31</b>	<b>44.</b>	<b>0</b>	<b>0</b>	<b>70</b>	<b>100</b>
		<b>3</b>		<b>4</b>		<b>3</b>				

It is observed from the table 13 that 34.3 % of the graduates are ignorant about *Ganoderma* and ganotherapy whereas only 21.4% have little knowledge and 44.3 % with fairly enough knowledge about it. It is interesting to note that not a single (0%) respondent have a good knowledge about *Ganoderma*.

The study concludes that even among the SLC and above SLC graduates, the number of those who have some knowledge about *Ganoderma* is considerably less in spite of its miraculous health benefits for mankind. From these results we can easily figure out what the situation would be like regarding awareness of *Ganoderma* and its therapy among illiterates and under SLC candidates.





**Figure No-10: Bar diagram illustrating Awareness of *Ganoderma* and Ganotherapy among SLC and above SLC graduates.**

## CHAPTER - VII

## DISCUSSION AND CONCLUSION

Health is a sense of well being of body, mind and soul. Health means developing resistance power and power of functions of the body against diseases and absence of frequent illness. These are all the sources for a prosperous, disease free healthy life.

From time immemorial ever since man was born, a constant fight is going on between man and pathogenic microbes such as bacteria, virus etc. To undertake this fight on behalf of man, nature has gifted him a natural doctor right from his birth. This doctor alone keeps him to live longer without any disease. The name of this doctor in man is “Immunity”. This doctor was born with the man, dies with him. If immunity is strong, the body is able to fight effectively diseases caused by viruses, bacteria and other parasites. Our immune system is a virtually miraculous network of activities designed over millions of years to protect us from viruses, bacteria, parasites, molds, dust, pollen and malignant cells. If the immune system is weakened or malfunctioning, the invading microbes can easily establish a foothold in our body and disease sets in. Antibiotics can often be used to stop the invasion at this time, but chronic use of antibiotics is useless against viruses and most parasites. It is much better to resist the invasion from within with a fully fortified immune system and not become ill in the first place. This is where herbs like Reishi(*Ganoderma*) are now attracting the attention of scientists and consumers alike.

Reishi is indeed, “the great protector” protecting us on every level-physically, immunologically, mentally and spiritually. It helps us to adapt to the world and provides additional power for us to adapt to the world and to achieve a superior level of life. Red Reishi commonly known as Lingzhi in Chinese is a herbal mushroom known to have miraculous health benefits. Reishi is recommended as an immune modulator i.e. regulates and fine tunes the immune system and is also a general tonic and helps to prevent all kinds of diseases including microbial diseases. Hence various titles have been imparted to *Ganoderma* as “Universal Medicine”, “Kaliyug ko Sanjeevani Buti”, “A-one Medicine” etc.

Various studies on Reishi has indicated its antimicrobial applications i.e. antibacterial and antiviral actions Studies on the medicinal properties of *Ganoderma lucidum* have identified the effects of Reishi as mainly that of polysaccharides,

triterpenes, adenosine and essential fatty acids. On going clinical studies are now being conducted using sterols in cervical lesions induced by human papilloma virus, sinusitis, hepatitis C etc. Lingzhi has antimicrobial activity against influenza virus, dysentery and liver infection. It has been found to be antiviral, anti-parasitic, and anti-fungal. It has also been used in HIV support.

Although a considerable number of studies have been carried out on *Ganoderma* in Japan, China, USA and the UK in the past 30 years, very little or almost no proper research have been done in this regard in Nepal.

The findings derived from the statistical analysis of the data and under the limitation of objectives are listed below in order of study.

- i *Ganoderma* is used for a wide range of health problems including microbial diseases among which it is most commonly used for health disorders such as gastritis, skin diseases, sinusitis, asthma, common cold, loss of appetite, arthritis etc
- ii *Ganoderma* is observed to be effective for the cure and control of the health problems with 47% cases having very good results, 45% with good results and only 8% with satisfactory result and not a single case (0%) had a poor result. From the high percentage of very good (47%) and good (45%) result of ganotherapy, it is predictable that *Ganoderma* may have great pharmaceutical value for a wide range of health problems These effects of *Ganoderma* may be due to its main active ingredients such as polysaccharides as cleansers which have cleansing (detoxification) and

immune stimulating properties, adenosine as regulator for regulating body function, triterpenes as builder thus building resistance of body against diseases, ganoderic essence as regenerator for regenerating body cells and germanium as immunomodulator.

- iii Studies reveal the extensive adoption of ganotherapy for non microbial diseases than microbial diseases. In this modern world most of the common health problems prevailing today are basically caused due to environmental pollution than microbial actions. For the remedy of these problems most commonly people undergo chemotherapy, the chronic adoption of which leads to more complications due to the consequent side effects for which chemotherapy no more functions. Therefore as the last resort the patients have no other options than to

seek for newly introduced therapies to go for a try to see whether it works or not. In other words the non-microbial health problems are becoming more common and problematic to be cured by chemotherapy than microbial cases. This is probably the reason why the ratio of adoption of ganotherapy for non-microbial infections is higher than the microbial cases of infection

Ganotherapy being relatively more expensive mode of medication may possibly be another prime

reason for its limited adoption for microbial diseases. Since there are other cheaper means of treatments or cure for microbial infections, patients are perhaps reluctant to expend more on ganotherapy in spite of its extremely broad health benefits. The reason may also probably be due to the lack of public awareness about *Ganoderma* and its miraculous health benefits. The highest ratio of ganotherapy adoption for common cold may possibly be due to its relatively greater prevalence in the study area than other microbial infections.

- iv In the microbial cases of infection, adoption of ganotherapy is basically confined to bacterial and viral diseases. The current study reveals 84.2% of its adoption for viral diseases and 15.8% for bacterial diseases.
- v *Ganoderma* and its therapy is highly effective in the control and prevention of microbial infection. 56.1% results were observed very good, 38.6% results good and 5.3% results satisfactory but not a single case (0%) of poor result to observe.
- vi *Ganoderma* is the most effective mode of medication for the cure, control and prevention of microbial and non microbial diseases .Relatively very high percentage (91%) of the *Ganoderma* consumers are in support of ganotherapy and the rest for other therapies.
- vii Taking the use of various forms of *Ganoderma* products into consideration, RG and GL capsules are most effective forms and are used in about 56% of the cases of microbial diseases, while other forms are less effective and are used less frequently. The reasons for the relatively high consumption of RG & GL capsule by

the consumers may be due to the variation in the proportion of *Ganoderma* in the various products i.e. the RG &GL capsule have 100 % *Ganoderma* and are highly effective against many ailments than other products. On the contrary other products have relatively much less proportion of *Ganoderma* and are not as versatile and effective as RG & GL capsule to be used for a wide range of diseases. Hence these products have been used by fairly limited number of people.

- viii A very large proportion i.e. 67% of the total population is ignorant and unaware of *Ganoderma* and ganotherapy whereas 27% and 5% had known very little and fairly enough about it respectively and only 1% having good knowledge about it.
- ix Even among the SLC and above SLC graduates 34.3% of the graduates are ignorant about *Ganoderma* and ganotherapy whereas only 21.4% have little knowledge and 44.3% with fairly enough knowledge about it. Not a single respondent (0%) have a good knowledge about *Ganoderma*.

## CHAPTER - VIII

### RECOMMENDATIONS

On the basis of the analysis, interpretation and findings of this study, the researcher recommends the following points for further studies.

- ) Research work on *Ganoderma* should be encouraged for more findings on *Ganoderma* and its health benefits.
- ) In spite of its great medical significance, since majority of the Nepalese are ignorant about *Ganoderma* as revealed by the research, for public awareness about such a precious asset the topic of *Ganoderma* should be introduced in the curriculum as part of health science and in botany as a medicinal herb to signify its importance in the medical field at college or campus level.
- ) Considering its immense beneficial aspects, the cost of *Ganoderma* products is fairly reasonable. However in the context of Nepal where the per capita income is relatively low it is still beyond the access of general public. The cultivation of the herbal mushroom *Ganoderma* should be encouraged to meet the demand of raw material from within the country so that the products which are currently available at relatively higher price can be reasonably minimized to make them affordable to the general public.

- ) Currently the distribution of dxn products is restricted to only dxn centres, which are in limited number in Nepal and a few other centres. This limitation of supply of dxn products should be widened by making its supply open to hospitals, private clinics, health posts / centers, departmental stores etc for its easy access to the general public.
- ) More DXN centers should be established throughout the country for the effective conduction of workshops and training programmes for raising the awareness about *Ganoderma* and its role in maintaining health status and the adequate supply of DXN products to meet the public demand.
- ) A study is recommended to explore the role of *Ganoderma* and ganotherapy on specific parasitic and non-parasitic diseases.
- ) A similar study can be conducted to analyze and compare the effects of *Ganoderma* on various microbial diseases.

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# APPENDICES

## APPENDIX - A

### Questionnaire

“ROLE OF GANODERMA IN THE CONTROL AND PREVENTION OF MICROBIAL INFECTIONS”

### Surveillance Questionnaire for Consumer of *Ganoderma*

**Consumer's name :** ..... **Age**

**:** .....

**Locality**..... **Sex :**

.....

1. What are/were your health problems before you had taken *Ganoderma* or its products?

.....

.....

2. Is your health problem due to any microbial infection?

(a) Yes ( ) (b) No ( )

3. For how long have you been suffering from the illness / problem?

.....

.....



4. What was your health condition like during the period of illness?

.....

.....

5. Since then what type of medical treatment had you been undergoing before adopting ganotherapy?

(a) Allopathic treatment ( ) (b) Homeopathic treatment ( )

(c) Traditional treatment ( ) (d) Others ( )

6. For how long?

.....

.....

7. The result of medication was observed to be

(a) Poor ( ) (b) Satisfactory ( )

(c) Good ( ) (d) Very good ( )

8. For how long have you been adopting ganotherapy?

.....

.....

9. What is your main reason for adopting ganotherapy?

(a) Readily available and affordable mode of therapy ( )

(b) Relatively more efficient mode of therapy. ( )

- (c) No significant benefits gained from other therapies  
( )
- (d) Due to the reasons in (b) and (c) ( )

10. What was the dose taken?

.....  
.....

- 11 (i) Have you noticed any change in your health condition after adopting ganotherapy?  
(a) Yes ( ) (b) No ( )

(ii) If yes, what change?

.....  
.....

12. How long did it take to observe this change?

.....  
.....

13. In addition to your main health problem, did you see any improvements in other microbial diseases such as common cold, sinusitis, tetanus, skin infections etc? If so, name the infection.

.....  
.....

14. Are you still taking *Ganoderma*?

- (a) Yes ( )                      (b) No ( )

15. So far the result of ganotherapy is observed to be

- (a) Poor ( )                      (b) Satisfactory ( )  
(c) Good ( )                      (d) Very good ( )

16. What form of *Ganoderma* are you taking / have you taken?

- (a) Capsule ( )                      (b) Powder ( )  
(c) Other products ( )

17. After your experience of ganotherapy, what is your personal view about this preventive / control measure?

- (a) It is a highly effective mode of preventive /control measure. ( )  
(b) It is an effective mode of preventive / control measure. ( )  
(c) It is an ineffective mode of preventive /control measure. ( )

18. What would you suggest others / patients about *Ganoderma* ?

- (a) Better take *Ganoderma* for the control & prevention of                      infections. ( )  
(b) Better not take *Ganoderma* for the control & prevention of infections. ( )

19. After having experienced various modes of medications, what is your first priority for the same?

- (a) Allopathic medication ( )
- (b) Homeopathic medication ( )
- (c) Traditional medication ( )
- (d) Ganotherapy ( )
- (e) Others ( )

*KAP (Knowledge, Attitude, Practice) concerning Questions*

Consumer's name: .....

Sex:

.....

Locality: .....

Age:

.....

**Educational qualification:** .....

1. Have you ever heard of *Ganoderma*?

(a) Yes ( ) (b) No ( )

2. If yes, how much knowledge do you have about this mushroom?

(a) Not at all ( ) (b) Very little ( )

(c) Fairly enough ( ) (d) Good knowledge ( )

3. How did you get the information about *Ganoderma* and ganotherapy ?

(a) Through various media ( ) (b) From books & magazines ( )

(c) From friends & relatives ( ) (d) Other sources ( )

4. What type of medication do you normally adopt for the treatment, control and prevention of microbial infections?

(a) Allopathic medication ( ) (b) Homeopathic medication ( )

(c) Traditional medication ( ) (d) Others ( )

4. (i) Have you ever adopted ganotherapy ?

(a) Yes ( ) (b) No ( )

(ii) Why?

.....

.....

## APPENDIX - B

### ग्यानोडर्माका उपभोक्ताहरूको निम्ति सर्वेक्षक प्रश्नावली

उपभोक्ताको नाम : ..... लिङ्ग : .....

उमेर : ..... ठेगाना : .....

१. ग्यानोडर्मा वा यसबाट उत्पादन गरिएका सामाग्रीहरू प्रयोग गर्नु अगाडि तपाईंको स्वास्थ्यमा के-कस्ता समस्याहरू थिए ?

---

२. के तपाईंको स्वास्थ्य समस्या कुनै जीवाणुको संक्रमणले भएको थियो ?

क) थियो ( ) ख) थिएन ( )

३. कति समयसम्म तपाईं उक्त स्वास्थ्य समस्याबाट ग्रसित हुनुभएको थियो ?

---

४. उक्त समस्याबाट पिडित हुँदा तपाईंको स्वास्थ्य स्थिति कस्तो थियो ?

---

५. तपाईंले ग्यानोथेरापी अपनाउनु अघि कस्तो स्वास्थ्य उपचार गराउनुभएको थियो ?

क) डाक्टरी उपचार ( ) ख) जडीबुटी उपचार ( )

ग) धामीभाँभी ( ) घ) अन्य कुनै ( )

६. उक्त उपचारको नतिजा कस्तो पाउनुभयो ?

क) सन्तोषजनक छैन ( ) ख) ठिकै ( )

ग) राम्रो ( ) घ) धेरै राम्रो ( )

८. तपाईंले कहिले देखि ग्यानोथेरापी प्रयोग गर्नुभयो ?

---

९. तपाईंले ग्यानोथेरापी अपनाउनुको मुख्य कारण के हो ?

क) सस्तो तथा सजिलैसँग उपलब्ध हुने उपचार विधि भएकोले ( )

ख) यो उपचार विधि अन्य उपचार विधि भन्दा श्रेष्ठ भएकोले ( )

ग) अन्य उपचार विधिबाट उचित लाभ नभएकोले ( )

घ) ख र ग को कारणले ( )

१०. तपाईंले कति मात्रामा प्रयोग गर्नुभयो, अर्थात प्रतिदिन कति डोज लिनु भयो ?

---

११. अ) ग्यानोथेरापीको प्रयोग पछि के तपाईंले आफ्नो स्वास्थ्यमा केही भिन्नता पाउनुभयो ?  
 क) पाएँ ( ) ख) पाएन ( )  
 आ) यदि पाउनुभए, के भिन्नता पाउनुभयो, सकारात्मक वा नकारात्मक छोटकरीमा बताउनुहोस् ।
- 
- १२) यो भिन्नता पाउन कति समय लाग्यो ?
- 
१३. तपाईंको मुख्य रोग बाहेक अन्य रोगहरु जस्तै जुका, ब्याक्टेरिया तथा भाइरस संक्रमक रोगहरु (रुघा, खोकी, पिनास, टिटानस, छालाका रोगहरु) आदिमा पनि केही सुधार पाउनुभएको छ ? छ भने त्यो कुन चाहि रोग हो ?
- 
१४. के तपाईं अझै ग्यानोडर्मा प्रयोग गर्नुहुन्छ ?  
 क) गर्छु ( ) ख) गर्दिन ( )
१५. अहिलेसम्म ग्यानेथेरापीको नतिजा कस्तो पाउनुभयो ?  
 क) खराब ( ) ख) ठिकै ( ) ग)  
 राम्रो ( ) घ) धेरै राम्रो ( )
१६. ग्यानोडर्माको कुन प्रकार प्रयोग गर्दै हुनुहुन्छ/गर्नुहुन्थ्यो ?  
 क) क्यापसुल ( ) ख) पाउडर ( ) ग) अरु कुनै ( )
१७. ग्यानोथेरापीको अनुभव पछि यसको बारेमा तपाईंको व्यक्तिगत विचार के छ ?  
 क) यो प्रयोग एकदम उपयुक्त छ । ( )  
 ख) यो प्रयोग उपयुक्त छ । ( )  
 ग) यो प्रयोग उपयुक्त छैन । ( )
- १८) अरु व्यक्ति विरामीलाई ग्यानोडर्माको बारेमा के सल्लाह दिनुहुन्छ ?  
 क) ग्यानोडर्माको प्रयोग गर्नु राम्रो हो । ( )  
 ख) ग्यानोडर्माको प्रयोग गर्नु नराम्रो हो । ( )
- १९) धेरै प्रकारका उपचारको अनुभवपछि तपाईं कुन चाहिलाई बढी प्राथमिकता दिनुहुन्छ ?  
 क) डाक्टरी उपचार ( ) ख) जडीबुटीको उपचार ( )  
 ग) धामी भाँक्री ( ) घ) ग्यानोथेरापी ( )  
 ड) अन्य कुनै ( )



## APPENDIX – C

### CAUSATIVE AGENTS OF SOME MICROBIAL DISEASES

Diseases	Causative Agents
Common cold	Rhinoviruses, Parainfluenza, Respiratory syncytial virus
Dental caries	Bacteria ( <i>Streptococcus mutans</i> _)
Viral Fever	Alphavirus
Warts	Human papilloma virus (HPV)
Measles	Paramyxovirus
Typhoid Fever	<i>Salmonella typhi</i>
Tetanus	<i>Clostridium tetani</i>
Tonsillitis	Herpes simplex virus, <i>Streptococcus pyogenes</i> (GABHS) and Epstein-Barr virus (EBV), Cytomegalovirus, Adenovirus, Measles virus.
Sinusitis	Viral colds, <i>Streptococcus pneumoniae</i> and <i>Haemophilus influenzae</i>

## **APPENDIX - D**

### **TESTIMONIALS**

**1. Name: Mohan Krishna Gurung**

**Sex: Male**

**Age: 52 years**

**Address: Lamachaur, Pokhara, Kaski**

**Health problem: Chronic cough and cold**

**Statement:** The medical report of Fewa City hospital, Pokhara on 2063- 01-05 showed chronic cough and cold. I took medicine as suggested by the doctor for 4 months but there was no trace of improvement in my health condition at all. This led to the feelings of weakness and loss of my body weight. I could not sense any sort of taste and smell of food and had to take it by force without enjoying it. My friends and relatives were amazed and worried about my deteriorating health condition. Thus I was suffering from this problem for the last 4 months. At this my sister suggested me to take *Ganoderma* After I took the first dose of RG-GL, at first my

condition became so severe that I was unable to attend my duty at school and for sometime I regretted for taking *Ganoderma*. But the following day to my great surprise, I felt very fresh and healthy as I normally did when I was ok. I could sense the taste and smell of food and from that day onwards I got my appetite back, which I had lost for months. Since then significant improvement has been observed in my health condition due to the regular intake of *Ganoderma* which I am still continuing with.

Thanks to Dr. Lim, the founder of DXN, who discovered *Ganoderma*, a miraculous nature's gift, a boon to mankind on earth.

**2. Name: Sheetal Gurung**

**Sex: Female**

**Age: 17 yrs**

**Address: Gagangaunda,**

**Lekhnath Municipality, Kaski**

**Statement:** I have been suffering from dental problem since my childhood. In the beginning I got infection on only one tooth and did not bother about it but later on when I started to get very bad toothache frequently, I realized that the bacteria had infected few more teeth. This gave me severe pain and trouble so I visited the dentist regularly for the past 2 years but still time and often I used to get bad toothache and the infection of other teeth has not been prevented yet. For this my aunty suggested me to use Ganozhi toothpaste. After the regular use of this toothpaste for a few months, I am relieved

from the frequent disastrous pain I used to get and the further infection of the healthy teeth has been prevented. Since last year I have been using Ganozhi toothpaste and my dental condition has improved considerably and now I can eat and chew all kinds of food without any difficulty.

*Ganoderma* is indeed superb; it is of course God's gift from heaven for mankind to live a healthy and comfortable life.

**3. Name: Damber Sunuwar**  
**Sex: Male**  
**Age: 30 yrs**  
**Address: Chawahil-6, Kathmandu**

Health Problem: Lung T.B

**Statement:** I was suffering from lung T.B for a long time of 5 years and was undergoing thorough medication when I was working in a hotel as a chef in Philippines. In spite of this, my health condition was still critical. I was physically very weak. There in Philippines, I came to know about DXN and *Ganoderma* and its miraculous health benefits. So I started to take *Ganoderma*, which resulted in amazingly drastic improvement in my health condition. Now I am living a normal healthy life and work for the health and welfare of the Nepalese people back in Nepal.

**Thank you to Dr. Lim for his immense contribution to mankind in the field of health sector through DXN, which is flourishing globally day by day.**

4. Name: Mr. Yang Pen-An

Disease: Hepatitis B antigens, pityriasis versicolor

**Address: Sungshan District, Taipei, Taiwan**

**Statement:** "I'm 46 years old and a civil aviation pilot. Twenty years ago I was diagnosed as having hepatitis B, and I was hospitalized for acute hepatitis. In addition, I frequently had pityriasis versicolor on my cheeks in the summertime, and my hands and feet felt icy cold in the winter. These problems made me miserable for many years."

"I began using Lingzhi in 1994. In the beginning, I often felt sleepy, in poor spirits, and itchy around the waist. I also excreted old stools. My pityriasis versicolor never recurred during the next year, and the coldness of my hand and feet also improved during the winter of the same year. During the third year, a medical checkup indicated that my hepatitis B was completely cured."

"My confidence in Lingzhi has grown steadily, and I still take it every day as a health tonic. Thanks to Lingzhi that I have been able to escape problems that troubled me for years. I hope that by sharing my experiences I can help even more people recover their health through Lingzhi."

[www.shuanghor.com](http://www.shuanghor.com)

5. Name: Ms Hsieh Yueh-E

**Address: Shulin, Taipei**

**Country: Taiwan**

**Disease: Women's disorders, cranial  
neurasthenia, frequent colds,  
migraine acute nephritis**

**Statement:** "I had been suffering from women's disorders,

cranial neurasthenia, frequent colds, migraine, and acute nephritis before I started taking Lingzhi, and I often felt very great discomfort. Whenever I had my period, it would last half a month if I had a cold too. Migraine affected my sleep, and I had to take painkillers to sleep at night. The pain and discomfort was horrible. I eagerly started taking increasing doses of Lingzhi in 1997. After about two weeks, I experienced a dry mouth, burning of the tongue, frequent tears, back pain and stiffness, and much acne on my face. My condition began to improve gradually after two months. Nowadays I feel very good. I have fewer colds, the quality of my sleep has improved considerably, and my migraine has gone away. My friends all say that I look like I'm 20 years old." Thanks to Lingzhi, I don't have to see the doctor very often." ([www.shuanghor.com](http://www.shuanghor.com))

**6. Name: Mr. Wang Chin- Ju**

**Address: Wenshan District, Taipei, Taiwan**

**Disease: Hepatitis B**

**Statement:** Mr. Wang was hospitalized for more than one year Due to acute hepatitis B at the age of 19, and was unable to work. Because his sales work required socializing, he later drank regularly and after several years his liver function deteriorated and he suffered from frequent fatigue. He began taking Lingzhi in 1991. After several years, he felt strong and vigorous, and had even donated blood on several occasions. This shows that he had recovered normal liver function. ([www.shuanghor.com](http://www.shuanghor.com))

**7. Name: Mr.U.R. Rajagopalan**

**Disease: Malarial Fever**

**Statement:** Malarial fever recurrence. Intermittent fever for 3 months-Severe medication on allopathy drugs. This led to loss of appetite, health deterioration and was unable to do my daily work. Started therapy of *Ganoderma* in May 2000 with 1 pair in the 1st week and increased to one more pair from 2nd week onwards. I could feel noticeable relief from 3rd week onwards. My fever disappeared, appetite improved, was able to do my day-to-day work with stamina. DXN *Ganoderma* has built my lost resistance power due to indiscriminate usage of allopathic drugs. I am maintaining the same 2 pairs now. It is almost three years since I had the malarial attack. I am free from any disorder in my body and I am 55 years young with DXN *Ganoderma*. Thanks to Dr.Lim Siow Jin for bringing DXN to India and thanks to my upline for giving me an opportunity to spread DXN mission of health care products to thousands of people, suffering from ailment without permanent relief from various systems of medication available. ([www.geocities.com](http://www.geocities.com))

**8. Name: Mr.R. Karthegeyan**

**Disease: Urinary infection**

**Statement:** I had severe gastro-intestinal disorder and Urinary infection for two years. Allopathic drugs had not given me relief. During Feb 2003, I started a pair Reishi and GL daily. I had relief from Gastric problem and urinary infection from the third week. Till date, I am continuing the same one pair as a preventive medicine. DXN has given me a good opportunity to set right my disorder in the body at an early age. ([www.geocities.com](http://www.geocities.com))

**9. Disease: Toxoplasma**

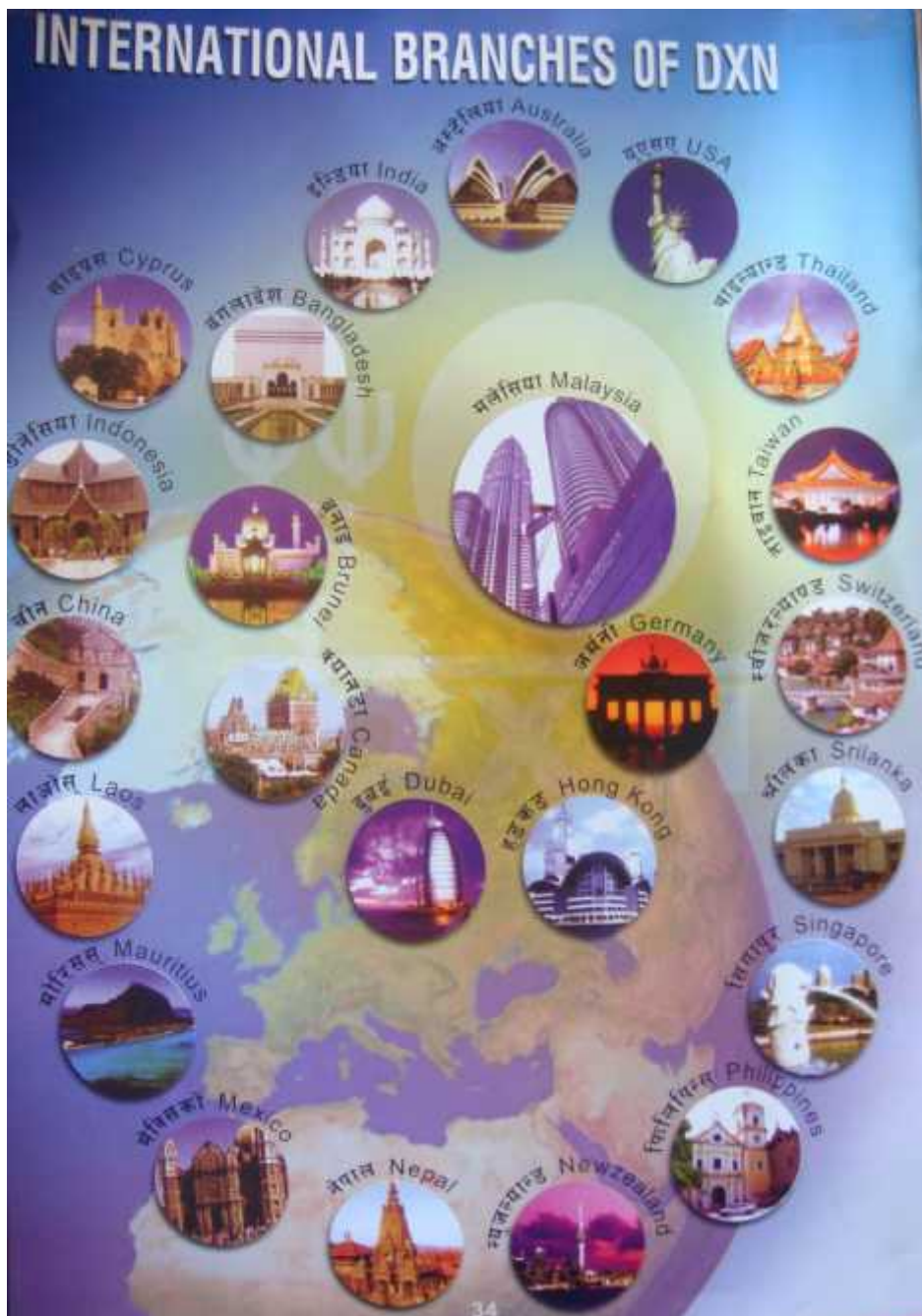
**Name: Mrs. Sumy Antony**

**Statement:** Not able to conceive for 3 years due to taxoplasma (an infection from pets) abortion occurred 2 times when conceived, started RG+GL on 07.05.2002 with 6 pairs daily. After 4 months, pregnancy was observed positive. She delivered a girlbaby with 3.5 kg by normal delivery.The baby was named Anna Maria Ganozhi.([www.geocities.com](http://www.geocities.com))

# APPENDIX – E

## PHOTOGRAPHS

### INTERNATIONAL BRANCHES OF DXN





## DXN CENTRES OF NEPAL





**Researcher Interviewing Respondent**