Forgotten Healer of the Himalayas

Shilajit

Chapter 1: History

Shilajit is a pale-brown to blackish-brown exudation, of variable consistency, exuding from layers of rocks in many mountain ranges of the world, especially the Himalayas and Hindukush ranges of the Indian subcontinent[1]. It usually flows during the summer when the mountains get warm[2]. It has been found to consist of a complex mixture of organic humic substances and plant and microbial metabolites occurring in the rock rhizospheres of its natural habitat[1].

Shilajit has been used as a rejuvenator and an adaptogen for thousands of years, in one form or another, as part of traditional systems of medicine in a number of countries. Many therapeutic properties have been ascribed to it, a number of which have been verified by modern scientific evaluation. Shilajit has been attributed with many miraculous healing properties.

Shilajit or Silajatu or Shilajatu as it is called in the Indian system of medicine has been known for its healing properties centuries ago. There is some indication that shilajit may have been the priceless “soma” of the Eastern alchemists. Soma was considered the elixir of immortality, the secret substance used by alchemists to perfect both body and mind. Health care providers compare this with ginseng of the Chinese medicine and many even call this as ‘Indian Ginseng’. Shilajit is a Sanskrit term. Its equivalent in English is Mineral Pitch. The botanical name of Shilajit is Asphaltum.

Reference

1.Suraj P. Agarwal, Rajesh Khanna, Ritesh Karmarkar, Md. Khalid Anwer , Roop K. Khar. **Shilajit: a review. Phytotherapy Research (May 2007),** Volume 21, Issue 5, Pages 401 – 405

2. www.drhartman.com

Other names[1]

- Sanskrit name – Shilajit, Shilajitu, Dhaturas, Dhatusara, Shiladhatu,
- English name – Mineral pitch, Black bitumen, Bituminous pitch, Jew's Pitch
- Botanical name – Asphaltum
- Common names – Shilajit, Indian Viagra
- Arab name - Hajar-ul-musa
- Bengali name - Silajitu
- Persian Name - Momiai Faqurul Yahud

Mythology of Shilajit[2]

Shilajit has been mentioned in many Hindu literature including medical texts like Charaka Samhita which was written more than 3000 years ago. It is believed that shilajit was given by Lord Shiva to King Chandra Varma to get back his youth fullness. Chandra Varma was a great King who ruled a vast empire that included the northern parts of India. He is one of the ancestors of Buddha, founder of Buddhism. King Chandra Varma was an efficient warrior. He had many enemies. During his younger days, he kept waging wars against his enemies in order to protect his kingdom. By the time he eliminated all his enemies, he was very old and was above 50 years of age.

Having a vast empire with good assets and material resources, King Chandra Varma wanted to live the best of lives since all the years he was busy fighting battles. But he could not enjoy to the extent he wanted as he had become old. He went to the Himalayas and went on Penance for months in prayer.

Reference
1. www.rpcshilajit.com
2 .www.rudramani.com

According to the ancient story, Shiva was pleased by the king's sincerity. He appeared before King Chandra Varma and asked him what he wanted. King Chandra Varma told him that he wanted to become young again so that he can enjoy his life. Shiva offered a substance from his own body. This substance is shilajit. After consuming shilajit, King Chandra Varma became young again.

Shiva is said to reside in Mount Kailash, which is one of the peaks in the Himalayan Mountains. Hence shilajit is said to be extracted from the Himalayan ranges. King Chandra Varma who was the first to take Shilajit is still revered even now by local populace in India.

Shilajit is created by run off in the Himalayas that deposits organic material into the crevices and fissures of stones. The resinous substance comes to the surface and melts. It is dark red to brown to almost black in color and very bitter and is said to enhance the efficacy of any other formula taken. Technically, Shilajit is an exudate that is pressed out from layers of rock in Himalayas and other areas. It is composed of humus and organic plant material that has been compressed by layers of rock. Humus is formed when soil microorganisms decompose animal and plant material into elements usable by plants. Plants are the source of all our food and humus is the source of plant food. Unlike other soil humus, Shilajit humus consists of 60%-80% organic mass[1].

Shilajit is extremely rich in bioactive minerals. The active principle of Shilajit is fulvic acid. In ancient India, it was considered a panacea for all diseases. It was believed that no major disease was curable unless and until, shilajit was included in the drug preparation. Shilajit has been used for more than 3000 years now. It is one of the important components in the Ayurvedic system of medicine.

Reference

www.rpcshilajit.com

Shilajit and Ayurveda

Ayurveda is an intricate system of healing that originated in India thousands of years ago. Ayurvedic system of medicine is one of the world's oldest medical systems. It originated in India and has evolved there over thousands of years. In the United States, Ayurveda is considered Complementary and Alternative Medicine (CAM) - more specifically, a CAM whole medical system. Ayurveda is based on ideas from traditional healers from India and Nepal. Some Ayurvedic ideas also evolved from ancient Persian thoughts about health and healing. Many Ayurvedic practices were handed down by word of mouth and were used before there were written records. Two ancient books, written in Sanskrit on palm leaves more than 2,000 years ago, are thought to be the first texts on Ayurveda

- Charaka Samhita
- Susruta Samhita

In the Charaka Samhita, Shilajit is described as a product of four minerals: gold, silver, copper and iron, whereas Susruta Samhita included two more minerals, lead and zinc in its composition. According to the predominance of the minerals of the source rock, it was classified into four categories: Sauvarna, Rajat, Tamra and Lauha. The last variety Lauha shilajit or blackish-brown Shilajit is common and is supposed to be most effective. Charaka Samhita mentions that without the aid of Shilajit no curable disease can be alleviated. According to Sushruta, in the months of May-June the sap or juice of plants comes out as gummy exudation from the rocks of mountains due to strong heat of sun.

Origin of shilajit

At the dawn of creation, some speculate that India was a large island off the Australian coast separated from the Eurasian continent by the Tethys Sea[2].

Reference
1. http://nccam.nih.gov/health/ayurveda/
2. www.rpcshilajit.com

The Indian continent drifted north at a rate of about 9 meters a century. This movement led to the eventual disappearance of the Tethys Sea. The Indian continent collided with the Asian continent. This caused the bed of the Tethys sea to be pushed up and to continually move up to eventually form the Himalayan Mountains. The Himalayan mountains continue to rise more than 1 Centimeter a year.

During this transition the mineral rich and fertile soil of the sea bed gave rise to a lush and dense tropical jungle. As the ground continued to be pushed up to become mountains a lot of the plants became trapped by layers of rock and soil and remained preserved for thousands of years. These plants have never been exposed to any chemicals, fertilizers or pesticides. They are gradually transformed into humus, a rich organic mass that is food for new plant life.

Due to microbial action and the tremendous pressure from the weight of the Himalayan Mountains, the ancient humus was transformed into a dense, viscous, mineral rich mass[1]. This is shilajit. The trapped layer of Shilajit becomes exposed due to the freezing winters, hot summer Sun and erosion from monsoon rains. Shilajit will flow out from between the cracks in the layers of rock during the summer when the temperature of the mountains gets warm enough and the Shilajit becomes less viscous. The native Nepali people then climb the mountains, repel down cliffs to collect the magical substance[1].

Shilajit has again entered the medical field for its potential benefits. The rediscovery of shilajit has been attributed to the villagers of Himalayas[2]. White monkeys, which dwell in the Himalayan region, are known for both their strength and longevity. These white monkeys migrate to the Himalayan Mountains during summer. When they return, they are seen chewing a semi-solid substance, which is seen between the layers of the rock.

Reference
1. www.hartman.com

2. www.dabur.com

Many villagers believe the strength and longevity of the white monkeys are due to that semi-solid substance. They got curious and started eating those substances. After eating it, many found a great improvement in their health. They found that the substance gave more strength and even relieved some of their gastrointestinal problems. This led to more people getting interested in shilajit. In the 18th century, many scientists started conducting studies on shilajit and analyzed its ingredients and properties.

This ancient wisdom was passed from generation to generation among the Indian and Nepali alchemists and holy men, but it escaped the notice of the Western medical establishment until the last days of the twentieth century, when explorer John Anderson heard of the amazing benefits of this substance and refused to give up the search until he found its source[1]. He journeyed throughout India and Nepal until he learned of the perilous harvesting of the raw shilajit from the cliffs. He also documented the reams of Sanskrit studies showing the rare plant's benefits. He spoke firsthand with more than fifty Indian and Nepalese researchers that have been studying the wonderful effects of shilajit and perfecting the processes for delivering the purest, most concentrated shilajit ever known to man.

A few other resources say that Shilajit was first discovered in Modern times by British Explorer Sir Martin Edward Stanley during the 1870's when India and Nepal were part of the British Empire[2] . Sir Edward Stanley, on his exploration in the higher altitude of the Himalayas, to his surprise found there were hardly any monkeys with aged looks during his months of expedition. He subsequently observed that monkeys there regularly ate something from the earth near the rocks. That was an odd behavior as monkeys typically do not eat rocky substances. He observed that the monkeys ate a blackish mineral pitch oozing near the rocks. That pitch is shilajit.

References
1. www.drhartman.com
2. www.rudramani.com

Shilajit is perhaps the most potent rejuvenator and anti aging substance ever known to mankind. Shilajit is believed to arrest and reverse the aging process. Indian Yogis on seeing the powers of Shilajit considered Shilajit to have divine powers capable of healing the body of virtually any ailments and above all to restore youthfulness.

Shilajit is also found in Afghanistan, Bhutan, China, Nepal, Pakistan, Tibet and some regions of the former USSR (Caucasus, Ural), as well as in Norway, where it is gathered in small quantities from steep rock faces at altitudes between 1000 and 5000 m. The therapeutic actions of the raw material vary by the region it is harvested from. There are other substances that contain humic and fulvic acids, but true shilajit has a very important therapeutic, bioactive ingredient that is not present in other shilajit-like substances.

The authenticity and therapeutic quality of shilajit is identified by the inclusion of **oxygenated di-benzo alpha pyrones**. While there are several areas from which the raw material is collected, the highest levels of therapeutic ingredients come from specific areas in the Himalayan Mountains in Nepal at 10,000-12,000 feet above sea level[1]. Historic records report that these “sacred” mountains produce the best shilajit. The processing of the raw Shilajit is very important as it contains free radicals and may also contain fungal toxins. Processing removes these free radicals, polymeric quinone radicals, toxins, mycotoxins, and other inactive ingredients.

Clinical research has shown that Shilajit has a positive effect on humans. It increases longevity, improves memory and cognitive ability, reduces allergies and respiratory problems, reduces stress, and relieves digestive troubles. It is anti-inflammatory, anti-oxidant, and eliminates free radicals. The research proves beyond a shadow of a doubt that Shilajit increases immunity, strength, and endurance, and lives up to its ancient reputation as the "destroyer of weakness".

Reference

1. http://www.crucible.org/shilajit.htm

Chapter 2: What is shilajit?

Despite the very ancient history of the use of shilajit, very little is really understood about its exact origin, even whether it is a plant material or mineral. Most likely, its resinous nature is due to the presence of mosses that have contributed to the formation of shilajit.

Shilajit is a pale brown to blackish gummy brown exudate of variable consistency of the plant Styrax officinalis[1]. Shilajit is found in the rocks of the Himalayan Mountains in India and also in Hindukush mountain ranges of Afghanistan. In the Himalayas and in Hindukush, shilajit can be seen oozing from the rocks. It is a mineral pitch mixed with the exudates of the plant Styrax officinalis[1]. It is a complex mixture of organic humic substances and plant and microbial metabolites occurring in the rock rhizospheres of its natural habitat.

Shilajit is a form of mineral that drips from the cracks of rocks during hot weather. It is the decomposition of plant matter in the rocks from thousands of years in the past. The bio transformed plant matter is extruded from the rocks by geothermal pressures. It is collected in raw form for further purification. It is bitter in taste, and its smell resembles cow's stale urine.

Ayurveda, which is an ancient Indian system of medicine, utilizes shilajit to treat many diseases. Shilajit is considered a panacea. It uses shilajit to increase strength, immunity and vitality. It is a natural anti-oxidant. The uses of shilajit as described in Ayurveda are –

- Boosting immunity
- General health tonic
- Optimizing physical performance
- Rejuvenation of muscles, bones and nerves

Reference

1. www.altcancer.com

Ingredients of Shilajit[3]

Shilajit is a herbo-mineral “compound”, which oozes out from a special type of mountain rocks in the peak summer months. It is found at high altitudes ranging from 1000 to 5000 meters. The active constituent of shilajit consists of dibenzo-alpha-pyrones and related metabolites, small peptides (constituting non-protein amino acids), some lipids and carrier molecules (fulvic acids). Standard shilajit contains at least 5-7% dibenzo-alpha-pyrones.

Researchers first began to investigate the chemical composition and bioactivity of shilajit in the early 1970s. Before then, it was not clear whether shilajit was a bitumen - a plant fossil - that had been exposed due to rock weathering at high altitude, or a material formed from modern plant remains.

Research done on shilajit has shown that it is mainly composed of humus along with a few organic substances. Humic substances are considered nature's own best medicine for plants, animals, humans, and the Earth itself. This lowly soil substance has the ability to clean up the Earth’s environment, neutralize radiation and deadly toxins, heal the agricultural lands, fuel the spark of life in living organisms, disarm and kill infectious pathogens, destroy the deadliest viruses, prevent most, if not all diseases, and even cure and restore diseased and damaged tissues and organs in plants, animals, and man[1].

Reference
1. www.drhartman.com
2. www.rpcshilajit.com
3. www.chemsoc.org

Humus refers to two different organic substances in the soil. They can be defined in perspective to earth sciences and to agriculture[1].

- In earth sciences – Humus is any organic matter which has reached a point of stability, where it will break down no further and might, if

conditions do not change, remain essentially as it is for centuries or millennia.

- In agriculture – Humus is a mature compost, or natural compost extracted from a forest or other spontaneous source for use to amend soil.

Humus consists of organic residues that have lost their original structure following rapid decomposition in the environment. Its composition changes constantly and it can disappear by slow decomposition unless new residual matter is incorporated. Among the various constituents of humus, two are of interest for the role they play in the field of health[2]. They are –

- Fulvic acid – This consists of low molecular weight substances like uronic acids, phenolic glycosides and amino acids.

- Humic acid – This consists of high molecular weight substances like phenolic acids

Humic substances consist of an immense arsenal and array of powerful phytochemicals, biochemicals, supercharged antioxidants, free-radical scavengers, super oxide dismutases, nutrients, enzymes, hormones, amino acids, antibiotics, antivirals, antifungals, etc[3]. Many of the substances that make up humic matter have yet to be discovered and catalogued among the known and documented organic chemicals. Due to microbial action and the tremendous pressure from the weight of the Himalayan Mountains, the ancient humus was

Reference
1. www.wikipedia.org
2. www.chemsoc.org
3. www.rpcshilajit.com

transformed into a dense, viscous, mineral rich mass. This is shilajit. The trapped layers of shilajit become exposed due to the freezing winters, hot summer sun and erosion from monsoon rains. Shilajit will flow out from between the cracks in the layers of rock during the summer when the temperature of the mountains gets warm enough and the shilajit becomes less viscous.

The humus content of the shilajit is a very special kind of humus. Unlike other soil humus, shilajit humus consists of 60-80% organic mass. Spectroscopic analysis done on it shows that it is similar to the humus found in the soil. Analysis of the humus of shilajit shows a lattice like structure with spaces of varying dimensions in between. The spaces are in the dimension of (0.010 -0.05 mm). These spaces contain diverse substances like organic molecules and metal complexes. These substances are responsible for the various therapeutic effects that are seen using shilajit[1].

Though shilajit has been used more than 3000 years ago, it attracted the attention of the scientists recently. Studies to prove its therapeutic applications were begun in the late 1970s. But controversies soon started regarding the nature of the content – whether shilajit is a fossil or is it composed of plants of recent origin. In 1976, while analyzing the contents of shilajit, the components of the plant Euphorbia royleana were discovered. The plant is named after Euphorbias, who was the court physician of Juba II, the Romanized ruler of a North African kingdom - in the first century AD[1].

Euphorbia plants grow in the temperate regions around the world. There are about 100 species of this plant growing around the world. When crushed these plants lets out a thick white latex substance. It is believed that this latex could have been transformed in to the components of shilajit. Some of the organic compounds in Euphorbia royleana and shilajit are also found in animals such as beavers, which frequently eat the buds and bark of trees, and this is thought to be responsible for the deposits in these animals.

Reference
1. www.chemsoc.org

The controversy continued till the mid 1980s when it was finally established that shilajit contains plant extracts of recent origin. Researchers from the Banaras Hindu University in India were the first to throw some light on some of the other ingredients of Shilajit[1]. In their analysis on shilajit, they found out that in addition to humus, shilajit also contains some biphenyl compounds. Incidentally,

these compounds were isolated from Trifolium repens, the plants that grow in the same region where shilajit oozes out of the rocks. This led to the speculation that humification of some native latex bearing plants contributes to the makeup of shilajit.

The scientists from Banaras Hindu University later found that shilajit also contains benzocoumarins, when they did column chromatography[1]. The results were quite exciting because biphenyls are a rare group of natural products in higher plants and no biphenyl with a carboxy function at C6 had been encountered before. Another exciting feature about these chemicals is that some of them possess anti-allergy compounds.

After the publication of the findings of the work done by the scientists from Banaras Hindu University, it became clear that humification of resin-bearing plants was responsible for the major organic mass of shilajit - about 80 per cent of the humus component[1]. The amount and composition of the remaining organic mass, which is a mixture of low molecular weight compounds, varies depending on where the shilajit comes from. The most common low molecular weight compounds present are oxygenated dibenzo-a-pyrones. So the composition of shilajit is influenced by factors such as[1] –

- Plant species involved
- Geological nature of the rock
- Local temperature profiles
- Humidity
- Altitude

Reference

1. www.chemsoc.org

Although the composition varies from place to place, the general consistency of samples from various sources points to a common production process that results from biological and chemical action on plant remains. The physiological properties of shilajit are due to compounds such as the dibenzo-a-

pyrones, along with triterpenes and phenolic lipids. Fulvic acids may also have a physiological role, acting as carrier molecules for the more bioactive smaller compounds. The following table shows the composition of shilajit obtained from various places[1] –

Sl.No.	Country of origin	PH of 1% solution	Percentage of low molecular weight compounds	Percentage of fulvic acid	Percentage of humic acid
1.	Kumaon, India	6.2	17.9	21.4	9.8
2.	Dolpa, Nepal	7.5	29.7	22.8	14.4
3.	Peshawar, Pakistan	6.8	4.3	15.5	5.6
4.	Tien–Shan, Russia	8.2	9.7	19.0	11.5

Reference
1. www.tattvaherbs.com

Types of shilajit

Shilajit has been used for centuries and has been part of the ayurvedic system of medicine. Scientists turned their attention towards categorizing shilajit

in the 18th century. Through a number of well conducted studies they found out the ingredients, pharmacological properties and benefits of shilajit.

As mentioned above the properties of shilajit depends on a number of factors. Four types of shilajit have been described by ancient Hindu writers[1]. They are –

- Gold shilajit (red)
- Silver shilajit (white)
- Copper shilajit (blue)
- Iron shilajit (blackish brown)

Blue and red shilajit are not found commonly and the most commonly available variety is iron shilajit and from the therapeutic point of view, it is considered to be the most active form. In addition a few resources mention about another type of shilajit called Russian shilajit or moomiyo.

Russian Shilajit[2]

Russian shilajit is one of the varieties of the shilajit extract. It is a rare extract which gets accumulated only twice a year.

Reference

1. www.holisticonline.com
2. www.tattvaherbs.com

It is also called as –

- Shilajit moomiyo extract
- Mumie
- Russian Black anabolic extract
- Mountain tear
- Mountain blood
- Balsam of rock

A few resources say that Aristotle had vividly described the utility of shilajit 2500 years ago. It is said that he proposed and accurately described the first procedures for the use of Moomiyo and its preparation in grape juice, honey and milk. It is believed that emperors like Alexander the Great, Tamerlane, Chenghiz Khan added Moomiyo to the ration of their Generals, personal guard and special units so that they can perform well in the battlefield.

Benefits of shilajit

Shilajit or moomiyo was first introduced to the scientific world in 1910. Various studies were done by National Science Laboratories using Government funding in Central Asian countries of Tajikistan and Uzbekistan. These are the countries where the extracts of moomiyo can be found. The benefits of moomiyo include-

- Shilajit increases potential effect on life span – The people of the Pamir Mountain Region in the Central Asia routinely use Moomiyo in their foods. Their life spans are 10 -15 years above the world average.

- It increases the strength and muscle mass and recuperative powers. The Russian military and the sports person have been using this extract for more than four decades now. It promotes rapid muscle growth by radical improvement in the activity of hormone glands. It improves workload by as much as 15-27% and dramatically shortens recovery time. It causes an up to 10 percent increase in the muscle mass. Shilajit is considered a strategic material and is used extensively as a performance enhancer within the Special Forces (Spetnaz and other elite fighting groups).

  In sports, shilajit is prized for its significant tonic and growth-promoting effect on both physical and mental processes. A budget of almost 6.5 million dollars was allocated by the Soviet government to the USSR National Sport Committee for research and application of shilajit

in sports during the preparation of athletes for the 1988 Olympic Games in Moscow.

- It promotes healing of bone fractures

- It boosts the immunity. Research has shown that patients taking shilajit have significantly increased concentration of the T cells, highly specialized immune agents that fight diseases by attacking alien microorganisms. Shilajit helps white blood cells called macrophages work better and faster. The macrophages job is to destroy and digest foreign material. This means that when strengthened with Moomiyo, white blood cells can ingest more bacteria, microbes and other alien cells.

Scientists also discovered that shilajit increases the production of Interleukin (IL-1), a protein that is released by the macrophages. Interleukin has important immune enhancing properties. IL-1 alerts the resting white blood cells when necessitated by the threats to the organism and spurs them into action. An important effect is the increase in the number of T-cells, the soldiers of the immune system. Russian cosmonauts also use moomiyo as it facilitates strong immune system, sound health and fast recovery during and after long space journeys.

While shilajit seems to be the most common form today. Rare Nepalese shilajit appears to be the most effective of all available forms. In some parts of Nepal it is considered more valuable than gold because of its healing properties.

Chapter 3: Studies done on Shilajit

A large-scale study published in the November 11, 1998 issue of the Journal of the American Medical Association, complementary and Alternative therapy (CAM) use among the general public increased from 33.8% in 1990 to 42.1% in 1997[1]. The results of the 1999 National Health Interview Survey

published in the Journal of Medical Care, 2002 has shown that 28.9% of the people above 18 years have used at least one form of CAM therapy in 1998. The belief in the CAM therapy is slowly growing[1]. Among the various Complementary and Alternative therapy, Herbal therapies and Nutritional therapies are quite popular. Shilajit is a herb used for various ailments, the recent indication being to treat the effects of aging.

Shilajit has been used for treating diseases for more than 3000 years. Shilajit is considered a "panacea", which by definition can cure almost any disease. A detailed description of shilajit has been found in Charaka Samhita, which is considered as the bible of Ayurveda. After the 18th century when the ingredients of shilajit were isolated, researchers started working on the pharmacological properties of shilajit and its use in the field of medicine. There are many studies which highlight the beneficial effects of shilajit in the field of medicine.

Igor Schepetkin et al from the Immunomodulation Research Center and Department of Biology Science, University of Ulsan, Korea and Altai State Technical University, Russia in their review article on Mumie (Russian shilajit) titled - 'Medical drugs from humus matter: Focus on mumie' have focused on the medicinal drugs from humus matter such as peat, sapropel, and mumie[2]. The most clinically available medicines, containing peat and sapropel extracts, are -

Reference

1. www.cancer.gov

2. Igor Schepetkin, Andrei Khlebnikov, Byoung Se Kwon. **Medical drugs from humus matter: Focus on mumie.** Drug Development Research (Nov 2002). Volume 57, Issue 3, Pages 140 – 159.

Torfot, Tolpa Peat Preparation (TPP), Peloidodistillate, Humisol, Peloidin, FiBS, and Eplir. Much attention in the review is concentrated on mumie composition, its

pharmacological properties, and new pharmacological drugs with mumie (Shilagen, Abana, Cystone, Diabecon 400, EveCare, Geriforte, Lukol, Pilex, Rumalava, Tentex forte, Nefrotec, Adrenotone, Siotone, La-Tone Gold, Andro-Surge, Solanova Libidoplex). It was concluded that therapeutic properties of crude extracts from peat, sapropel, and mumie have similarity to the ones of fulvic and humic acids. They are antibacterial, antitoxic, antiradical, antiulcerogenic, antiarthritic, immunomodulatory, and anti-inflammatory properties. Possible directions for better development of new drugs from humus matter are discussed.

Studies done on the effects of shilajit on brain

Schliebs et al from the Paul Flechsig Institute for Brain Research, Department of Neurochemistry, University of Leipzig, Germany conducted a study on shilajit to see its effects on the brain[1]. They confirmed the cognition-enhancing and memory-improving effects of shilajit. They attributed these effects of shilajit on the cortical and basal forebrain cholinergic signal transduction cascade. They conducted the study in rats. They administered shilajit at doses of 40 mg per kilogram body weight for 7 days. Administration of Shilajit led to reduced acetyl cholinesterase staining, restricted to the basal forebrain nuclei including medial septum and the vertical limb of the diagonal band. These effects on the brain prove shiljait to be an effective therapeutic intervention in Alzheimer's disease.

Reference

1. Schliebs R, Liebmann A, Bhattacharya SK, Kumar A, Ghosal S, Bigl V. **Systemic administration of defined extracts from Withania somnifera (Indian Ginseng) and Shilajit differentially affects cholinergic but not glutamatergic and GABAergic markers in rat brain.** Neurochem Int. 1997 Feb; 30(2):181-90.

Alzheimer’s disease is a disease of old age with features of progressive loss of short-term memory followed by generalized loss of cognitive and other brain functions, requiring the need for constant care and eventually death. It is present

in 17% of the population aged 65-69 and its incidence increases steadily with age. In those who are 95% or older, the incidence is 40-50%. Thus Alzheimer's disease is a major medical problem. So far there is no effective intervention for this. Shilajit and Indian ginseng another Indian herb hold promise to provide some relief in patients with Alzheimer's disease.

Bhattacharya and Kumar from The Department of Pharmacology, Banaras Hindu University, India conducted a study in 1997 to see the effect of Trasina, an ayurvedic herbal formulation, on experimental models of Alzheimer's disease and central cholinergic markers in rats[1]. Trasina is a herbal formulation of some Indian medicinal plants classified in Ayurveda, the classic Indian system of medicine, as Medhyarasayanas or drugs reputed to improve memory and intellect. Trasina is a combination of Shilajit, Withania somnifera, Tinospora cordifolia, Eclipta alba, Ocimum sanctum and Picrorrhiza kurroa.

Earlier experimental and clinical investigations have indicated that the formulation has a memory-facilitating action. In this investigation, the effect of Trasina, after sub chronic administration for 21 days, was assessed on two rodent models simulating some biochemical features known to be associated with Alzheimer's disease (AD). The models, in rats, included intra-cerebro-ventricularly (i.c.v.) administered colchicine (15 micrograms/rat) and lesioning of nucleus basalis magnocellularis (nbm) by ibotenic acid (10 micrograms/rat). Retention of an active avoidance response was used as the memory parameter. In addition, the effect of Trasina was evaluated on i.c.v. colchicine-induced

Reference

1. Bhattacharya SK, Kumar A. **Effect of Trasina, an ayurvedic herbal formulation, on experimental models of Alzheimer's disease and central cholinergic markers in rats.** J Altern Complement Med. 1997 Winter; 3(4):327-36.

depletion of acetylcholine (ACh) concentrations, reduction in choline acetyltransferase (ChAT) activity, and decrease in muscarinic cholinergic receptor (MCR) binding in rat brain frontal cortex and hippocampus. The

behavioral and biochemical investigations were done 7, 14, and 21 days after colchicine or ibotenic acid lesioning.

Trasina (200 and 500 mg/kg) was administered orally (p.o.) once daily for 21 days, the first drug administration being given just prior to lesioning. Colchicine and ibotenic acid induced marked retention deficit of active avoidance learning that was attenuated in a dose-dependent manner by Trasina after 14 and 21 days of treatment. Frontal cortical and hippocampal ACh concentrations, ChAT activity and MCR binding was significantly reduced after colchicine treatment. Trasina (200 and 500 mg/kg) reversed these deficits after 14 and 21 days of treatment. The findings indicate that the herbal formulation containing exerts a significant nootropic effect after sub chronic treatment that may be due to reversal of perturbed cholinergic function.

Bhattacharya et al from The Department of Pharmacology, Banaras Hindu University, India and the Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, India conducted a study in 1992 on the effect of Shilajit on rat brain monoamines[1]. According to them, shilajit (25 and 50 mg/kg i.p. for 5 days) significantly lowers the levels of 5 hydroxy tryptamine and 5 hydroxy indole acetic acid and increases the levels of dopamine, noradrenaline and their metabolites, in concert, in rat brains. The finding is appraised in view of its use as an Ayurvedic rasayan (rejuvenator).

Reference:-

1. S. K. Bhattacharya, S. Ghosal. **Effect of Shilajit on rat brain monoamines.** Phytotherapy Research (Jun 1992), Volume 6, Issue 3, Pages 163 – 164

Studies done on the effects of shilajit on learning and memory

Shibnath Ghosal et al from the Pharmaceutical Chemistry Research Laboratory, Department of Pharmaceutics, Institute of Technology, Banaras

Hindu University, India and the Department of Pharmacology, Institute of Medical Sciences, Banaras Hindu University, India, conducted a study on the effects of shilajit and its active constituents on learning and memory in rats in 1992[1]. Effects, in albino rats, of a processed shilajit (Sh-P), native shilajit (Sh-N) (unprocessed water-soluble fraction), and a preparation consisting of a mixture of ethyl acetate extractives (EE) and fulvic acids (FAs) from Sh-P, were evaluated in-

- An active avoidance
- Elevated plus-maze
- Open-field behavior paradigms

This study was undertaken to appraise the validity of use of shilajit as an Ayurvedic medha rasayan (enhancer of learning and memory). Sh-P and its active constituents (EE-FAs) significantly augmented learning acquisition and memory retrieval in the battery of tests, designed for this purpose, according to accepted tenets. Sh-N, on the other hand, produced erratic responses (both augmentative and retardative) in the above parameters. The U-shaped dose-responses shown by Sh-P and EE-FAs are reminiscent of agents that improve cognitive functions.

Additionally, Sh-P and EE-FAs, in high doses (25-50 mg/kg p.o.), produced significant anti-anxiety effect in the open-field behavior test. The present and earlier findings seem to suggest that the action of shilajit is mediated by facilitating communication between the immune and the central nervous systems. These findings reinforce our earlier postulate that purification of shilajit -

References:-

1. S. Ghosal, J. Lal, A. K. Jaiswal, S. K. Bhattacharya. **Effects of shilajit and its active constituents on learning and memory in rats.** Phytotherapy Research (Feb 1993), Volume 7, Issue 1 , Pages 29 – 34

- is an imperative necessity to ensure its optimum therapeutic effect. This would also safeguard from potential health risks associated with prolonged ingestion of raw shilajit containing free radicals and fungal toxins.

Studies done on the effects of shilajit on fertility

Park JS et al (October, 2006) from College of Pharmacy, Chungbuk National University, South Korea conducted a study to examine the possibility of using shilajit as a fertility agent to treat infertility[1]. They studied the effects of shilajit on the production of sperms and eggs in male and female rats. Shilajit was administered orally to 7-week-old rats over a 6-week period. In the male rats, the number of sperms in the testes and epididymides was significantly higher than in the control group.

A histological examination revealed an apparent increase in the number of seminiferous tubular cell layers in the testes of the treated rats. However, there were no significant differences in the weights of heart, spleen, liver, kidney, brain, testes and epididymides. In the female rats, the effect of Shilajit was estimated by the ovulation inducing activity. Over a 5-day period, ovulation was induced in seven out of nine rats in the Shilajit administration group, and in three out of nine rats in the control group. It was estimated that Shilajit had both a spermiogenic and ovogenic effect in mature rats.

Studies done on the effects of shilajit on other drugs

Morphine is a drug, which is commonly used for pain relief. But when used over a period of time, the analgesic or the pain relieving action diminishes. This is due to the effect called 'tolerance'. Shilajit is known to reverse this tolerance to the long-term administration of morphine.

Reference

1. Park JS, Kim GY, Han K. The spermatogenic and ovogenic effects of chronically administered Shilajit to rats. J Ethnopharmacol. 2006 Oct 11; 107(3):349-53.

Tiwari P et al (March, 2001) from Faculty of Pharmacy and Medical Sciences, Jordan confirmed this effect of shilajit by conducting a study in Swiss mice[1].

Chronic administration of morphine (10 mg/kg) to mice over a duration of 10 days resulted in the development of tolerance to the analgesic effect of morphine. Concomitant administration of processed shilajit with morphine, from day 6 to day 10, resulted in a significant inhibition of the development of tolerance to morphine (10 mg/kg, i.p.) induced analgesia. Processed Shilajit per se, in the doses used, did not elicit any significant analgesia in mice; nor did the chronic concomitant administration of Processed Shilajit alter the morphine-induced analgesia. These findings with Processed Shilajit indicate its potential as a prospective modifier of analgesic tolerance to morphine.

Shahjahan and Islam (November, 1998) from Drug Control Authority, Safat, Kuwait, evaluated shilajit as a suspending agent in the formulation of antacid preparations[2]. Carboxy methyl cellulose is the drug routinely used as a suspending agent. Shilajit produced effects on sedimentation volume similar to those produced by sodium carboxymethyl cellulose, but at lower concentrations. It induced better flocculation with a moderate increase in viscosity compared to CMC. It did not interfere with the acid-consuming capacity of the suspensions. So this study proves that Shilajit can be effectively used as a suspending agent for drug formulations.

Studies done on the adaptogenic effects of shilajit

In Ayurveda, shilajit and other herbs like Withania somnifera, Ocimum sanctum, Asparagus racemosus and Tribulus terristris are classified as 'Rasayanas' which are reputed to promote physical and mental health,

Reference

1. P Tiwari, P Ramarao, S Ghosal. **Effects of Shilajit on the development of tolerance to morphine in mice.** Phytotherapy Research (Mar 2001), Volume 15, Issue 2 , Pages 177 – 179

2. Shahjahan M, Islam I. **Preliminary evaluation of shilajit as a suspending agent in antacid suspensions.** Drug Dev Ind Pharm. 1998 Nov; 24(11):1109-12.

improve defense mechanisms of the body and enhance longevity. These attributes are similar to the modern concept of adaptogenic agents, which are, known to afford protection of the human physiological system against diverse stressors.

Bhattacharya et al (February,2001) from Department of Pharmacology, Institute of Medical Sciences, Banaras Hindu University, India, did a study to investigate the adaptogenic activity of Siotone (ST) which contains shilajit against chronic unpredictable, but mild, foot shock stress induced perturbations in behavior (depression), glucose metabolism, suppressed male sexual behavior, immunosuppression and cognitive dysfunction in CF strain albino rats[1]. Gastric ulceration, adrenal gland and spleen weights, ascorbic acid and corticosterone concentrations of adrenal cortex, and plasma corticosterone levels, were used as the stress indices. Panax ginseng (PG) was used as the standard adaptogenic agent for comparison. Additionally, rat brain levels of tribulin, an endogenous substance postulated to be involved in stress, were also assessed in terms of endogenous monoamine oxidase (MAO) A and MAOB inhibitory activity.

Chronic unpredictable foot shock induced marked gastric ulceration, significant increase in adrenal gland weight and plasma corticosterone levels, with concomitant decreases in spleen weight, and concentrations of adrenal gland ascorbic acid and corticosterone. These effects were attenuated by siotone (50 and 100 mg/kg) and PG (100 mg/kg), administered once daily over a period of 14 days, the period of stress induction. Chronic stress also induced glucose intolerance, suppressed male sexual behavior, induced behavioral depression and cognitive dysfunction, and immunosuppression. All these chronic stress-induced perturbations were attenuated, dose-dependently by siotone (50 and 100 mg/kg) and PG (100 mg/kg). Chronic stress-induced increase in rat brain tribulin activity was also reversed by these doses of siotone and by PG.

Reference
1. Bhattacharya SK, Bhattacharya A, Chakrabarti A. **Adaptogenic activity of Siotone, a polyherbal formulation of Ayurvedic rasayanas.** Indian J Exp Biol. 2000 Feb; 38(2):119-28.

The results indicate that siotone containing shilajit has significant adaptogenic activity, qualitatively comparable to PG, against a variety of behavioral, biochemical and physiological perturbations induced by unpredictable stress, which has been proposed to be a better indicator of clinical stress than acute stress parameters.

Studies done on the effects of shilajit on exercise performance

Herbs have been used throughout history to enhance physical performance, but scientific scrutiny with controlled clinical trials has only recently been used to study such effects. Bucci (August, 2000) from Weider Nutrition International, USA in his review article has written that controlled studies of herbs including shilajit found improvements in exercise performance when most of the following conditions were true[1]-

- Use of standardized root extracts
- Study duration (>8 wk, daily dose >1 g dried root or equivalent)

Improvements in muscular strength, maximal oxygen uptake, work capacity, fuel homeostasis, serum lactate, heart rate, visual and auditory reaction times, alertness, and psychomotor skills have also been repeatedly documented.

Bucci has concluded his article by saying that future research on ergogenic effects of herbs including shilajit should consider identity and amount of substance or presumed active ingredients administered, dose response, duration of test period, proper experimental controls, measurement of psychological and physiologic parameters (including antioxidant actions), and measurements of performance pertinent to intended uses.

Reference

1. Bucci LR. **Selected herbals and human exercise performance.** Am J Clin Nutr. 2000 Aug; 72(2 Suppl):624S-36S.

Studies done on the effects of shilajit on peptic ulcer

Goel et al from Department of Pharmacology, Banaras Hindu University, Varanasi, India conducted a study on the effects of shilajit in treating peptic ulcer[1] They found out that Shilajit increased the carbohydrate/protein ratio and decreased gastric ulcer index, indicating an increased mucus barrier.

Shibnath Ghosal et al from the Department of Pharmaceutics, Banaras Hindu University, India conducted a study on the anti-ulcerogenic activity of fulvic acids and 4'-methoxy-6-carbomethoxybiphenyl isolated from shilajit[2]. Fulvic acids (FA) and 4'-methoxy-6-carbomethoxybiphenyl (MCB, 1), two major organic compounds isolated from Shilajit (a humus product), were screened for anti-ulcerogenic activity in albino rats. Both FA and MCB showed significant anti-ulcerogenic effects in the battery of tests accepted for this purpose. The mechanism of anti-ulcerogenic action was studied with MCB on the basis of its effects on mucin content (gastric juice carbohydrates and carbohydrate/protein ratio) and on the concentration of DNA and protein in the gastric juice. The MCB-induced changes in the mucosa provided resistance against the effect of ulcerogens and also against shedding of mucosal cells. A preliminary acute toxicity study indicated that both FA and MCB had a low order of toxicity.

Shahjahan M and Islam I from the Drug Control Authority, Safat, Kuwait conducted a study on shilajit as a suspending agent in antacid suspensions[3]. Antacid suspensions are preparations used to relieve the symptoms of acidity.

Reference
1. Goel RK, Banerjee RS, Acharya SB. **Antiulcerogenic and anti-inflammatory studies with shilajit.** J Ethnopharmacol. 1990 Apr; 29(1):95-103.
2. Shibnath Ghosal, Sushil K. Singh, Yatendra Kumar, Radheyshyam Srivastava, Raj K. Goel, Radharaman Dey**,** Salil K. Bhattacharya. **Anti-ulcerogenic activity of fulvic acids and 4' -**

methoxy-6-carbomethoxybiphenyl isolated from shilajit. Phytotherapy Research (Dec 1998), Volume 2, Issue 4 , Pages 187 – 191

3. Shahjahan M, Islam I. **Preliminary evaluation of shilajit as a suspending agent in antacid suspensions.** Drug Dev Ind Pharm. 1998 Nov; 24(11):1109-12.

The efficacy of shilajit, a gummy exudate of the plant Styrax officinalis Linn was evaluated as a suspending agent for the formulation of antacid preparations. Shilajit produced effects on sedimentation volume similar to those produced by sodium carboxymethyl cellulose (CMC), but at lower concentrations. It induced better flocculation with a moderate increase in viscosity compared to CMC. It did not interfere with the acid-consuming capacity of the suspensions.

Studies done on the anti-inflammatory effects of shilajit

Inflammation is the body's response to injury. This injury, or trauma, may be caused by a blow or wound, eye surgery, a disease such as a virus, bacteria infection, or a parasite. It is a process by which the body's white blood cells and chemicals protect us from infection and foreign substances such as bacteria and viruses. When inflammation occurs normally, chemicals from the body's white blood cells are released to protect us from foreign substances. Sometimes, however, the white blood cells and their inflammatory chemicals cause damage to the body's tissues. Inflammation is characterized by pain, redness, swelling, warmth and loss of function. Shilajit is a powerful anti-inflammatory agent. It prevents the unwanted side effects of inflammation.

Goel et al from Department of Pharmacology, Banaras Hindu University, Varanasi, India conducted a study on the anti-inflammatory effects of shilajit[1]. Shilajit was found to have significant anti-inflammatory effect in carrageenan-induced acute pedal edema, granuloma pouch and adjuvant-induced arthritis in rats. In another study conducted on the anti-inflammatory effects of shilajit, it was shown to reduce the swelling associated with inflammation by 76%.

Studies done on the effects of shilajit on blood glucose and lipid profile

Reference

1. Goel RK, Banerjee RS, Acharya SB. **Antiulcerogenic and anti-inflammatory studies with shilajit.** J Ethnopharmacol. 1990 Apr; 29(1):95-103.

Trivedi et al from the Department of Pharmacology, Medical College, Baroda conducted a study on the effects of shilajit on blood glucose and lipid profile in alloxan induced diabetic rats in 2004[1]. They compared the effects in euglycemic and diabetic rats along with the conventional anti-diabetic drugs. Diabetes was induced in albino rats by administration of a single dose of alloxan monohydrate 5% (125 mg/kg, i.p). Three different doses of shilajit (50, 100 and 200 mg/kg/day, orally) were given alone for 4 weeks and a combination of shilajit (100 mg/kg/day, orally) with either glibenclamide (5 mg/kg/day, orally) or metformin (0.5 g/kg/day, orally) for 4 weeks were given and their effects on blood glucose and lipid profile were studied.

In the diabetic rats, all the three doses of shilajit produced a significant reduction in blood glucose levels and also produced beneficial effects on the lipid profile. The maximum effect was observed with the 100 mg/kg/day dose of shilajit. Combination of shilajit (100 mg/kg) with glibenclamide (5 mg/kg/day) or metformin (0.5 gm/kg/day) significantly enhanced the glucose-lowering ability and improvement in lipid profile than any of these drugs given alone. The hypoglycemic effect of shilajit (100 mg/kg) is significantly higher than that of metformin (500 mg/kg). But the combination of shilajit with metformin produced no further significant reduction in the blood glucose level compared to that produced by shilajit (100 mg/kg) alone. Shilajit is thus effective in controlling blood glucose levels and improves the lipid profile.

Nidhi Saxena et al from the Department of Biochemistry, Lucknow University, India did a study on the oxidative status in diabetic patients[2]. They did the study to find how shilajit modulated the oxidative response.

Reference

1. Trivedi NA, Mazumdar B, Bhatt JD, Hemavathi KG. **Effect of shilajit on blood glucose and lipid profile in alloxan-induced diabetic rats.** Indian Journal of Pharmacology (2004). Volume 36, Issue 6, Page 373-376

2. Nidhi Saxena, PHD, Upendra N. Dwivedi, PHD, Raj K. Singh, PHD, Arvind Kumar, MD, Chhavi Saxena, MSC, BAMS, Ram C. Saxena, MD and Mona Saxena, PHD. **Modulation of Oxidative and Antioxidative Status in Diabetes by Asphaltum Panjabinum.** Diabetes Care, 2003, 26:2469-2470.

Oxidative stress in diabetes, a common metabolic disorder, damages organs, including the ß-cells of the islets of Langerhans. In an ancient, traditional system of medicine, Asphaltum panjabinum (shilajit) has been reported to possess an adaptogenic activity (a rasayan), which reverts a pathological state to a physiological one with increased nonspecific resistance.

This study was conducted in 61 diabetic subjects of either sex, aged 31–70 years, who were on unchanged dosages of glibenclamide and served as their own control subjects. Shilajit was administered as two capsules (500 mg each; Dabur India) twice daily for 30 days. Treatment with shilajit exhibited a significant decrease in values of malondialdehyde compared with their higher pretreatment values, whereas values of catalase in diabetic subjects were significantly increased after treatment with shilajit. However, values of superoxide dismutase (SOD) and glutathione peroxidase in diabetic subjects were reduced after shilajit treatment.

Shilajit has been reported to be a panacea for variety of diseases in Asian medicine. In humans, there is limited evidence concerning the role of free radicals and antioxidants in diabetes. This is the first clinical study with shilajit to show its effect on antioxidant activity in diabetic subjects. These observations are supported by in vitro and liver homogenate experimental models.

It appears that shilajit, being an adaptogen, reverses this process by resetting defective electron transport chain reactions. Thus, it decreases the increased turnover of superoxide anion, as is reflected by the decreased demand

of SOD. Up regulation of catalase activity in the initial phases perhaps obviates the need for antioxidant enzymes in later steps.

Overall, shilajit results in the reduction of lipids per-oxidation. Thus, processed shilajit may be of value as a dietary supplement for modulating diabetes status, as well as for the prevention of diabetes complications, which is a real challenge for the present-day diabetologist.

Bhattacharya et al from the Department of Pharmacology, Banaras Hindu University, India conducted a study in 1997 on effect of Trasina, an Ayurvedic herbal formulation on pancreatic islet super oxide dismutase activity in hyperglycemic rats[1]. Trasina (TR) is a combination of Shilajit, Withania somnifera, Tinospora cordifolia, Eclipta alba, Ocimum sanctum and Picrorrhiza kurroa. In this study, diabetes mellitus was induced in male CF strain rats by streptozotocin (STZ) and hyperglycemia and super oxide dismutase (SOD) activity of pancreatic islet cells was assessed on days 7, 14, 21 and 28. STZ induced significant hyperglycemia and a concomitant decrease in islet cell SOD activity.

Trasina had little per se effect on blood sugar concentrations and islet SOD activity in euglycemic rats, in the doses of 100 and 200 mg/kg, p.o. administered once daily for 28 days. However, these doses of TR induced a dose- related decrease in STZ hyperglycemia and attenuation of STZ induced decrease in islet SOD activity. The results indicate that the earlier reported anti-hyperglycemic effect of TR may be due to pancreatic islet free radical scavenging activity, the hyperglycemic activity of STZ being the consequence of decrease in islet SOD activity leading to the accumulation of degenerative oxidative free radicals in islet beta-cells.

The same author did a similar study with an isolated shilajit preparation[2]. Diabetes mellitus was induced in male Wistar rats by the administration of streptozotocin (STZ, 45 mg/kg, s.c. on 2 consecutive days). Hyperglycemia and

Reference
1. Bhattacharya SK, Satyan KS, Chakrabarti A. **Effect of Trasina, an Ayurvedic herbal formulation, on pancreatic islet super oxide dismutase activity in hyperglycemic rats.** Indian J Exp Biol. 1997 Mar; 35(3):297-9.
2. Salil K. Bhattacharya. **Shilajit attenuates streptozotocin induced diabetes mellitus and decrease in pancreatic islet superoxide dismutase activity in rats.** Phytotherapy Research. Volume 9, Issue 1, Pages 41 - 44

super oxide dismutase activity of pancreatic islet cells was assessed on days 7, 14, 21 and 28, following STZ administration. In two other groups, shilajit (50 and 100 mg/kg, p.o.) was administered concurrently for 28 days. STZ induced significant hyperglycemia by day 14, which increased progressively on days 21 and 28. STZ also induced a decrease in pancreatic islet cell super oxide dismutase, which was apparent by day 7 and increased progressively, thereafter on days 14, 21 and 28. Shilajit (50 and 100 mg/kg, p.o.) had no discernible *per se* effect on blood glucose levels in normal rats but attenuated the hyperglycemic response of STZ from day 14 onwards, though only the effect of the higher dose was statistically significant.

Similarly, both the doses of shilajit reduced the STZ-induced decrease in super oxide dismutase activity from day 14 onwards, the effect of the lower dose being statistically insignificant. The findings confirm earlier observations that STZ-induced hyperglycemia may be the consequence of a decrease in pancreatic islet super oxide dismutase activity, leading to accumulation of free radicals and damage of the Beta cells. Shilajit attenuates both these effects of STZ possibly by its action as a free radical scavenger. The findings support the postulate that shilajit can prevent maturity onset diabetes mellitus.

A similar study titled ‘Shilajit-induced potentiation of the hypoglycemic action of insulin and inhibition of streptozotocin induced diabetes in rat’ was done by Kanikannan et al from the Division of Pharmacology, Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, India and the

Pharmaceutical Chemistry Research Laboratory, Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, India[1]. The effects of subcutaneous (s.c.) administration of processed shilajit (PS) alone and in

Reference

1. N. Kanikkannan, P. Ramarao, S. Ghosal. **Shilajit-induced potentiation of the hypoglycemic action of insulin and inhibition of streptozotocin induced diabetes in rat.** Phytotherapy Research (Nov 1995), Volume 9, Issue 7 , Pages 478 – 481

combinations with insulin (s.c.) on plasma glucose levels (PGL) were determined in either sex of streptozotocin-induced diabetic (SID) rats. PS (50 µ/kg; s.c.) did not alter plasma glucose levels in SID rats. Insulin (0.25-1.0 U/kg; s.c.), dose-dependently produced hypoglycemia in SID rats. PS (50 µg/kg; s.c.) potentiated and prolonged the hypoglycemic action of insulin when administered concurrently.

Chronic administration of PS (0.1-10 mg/kg; b.i.d. for 10 days; i.p.) had no influence per se on plasma glucose levels. Chronic administration of PS (1.0 mg/kg; b.i.d. for 10 days; i.p.) prevented the streptozotocin (STZ)-induced diabetes in rats, whereas a relatively lower (0.1 mg/kg; b.i.d. for 10 days; i.p.) and significantly higher dose (10 mg/kg; b.i.d. for 10 days; i.p.) of PS had no influence on the STZ-induced diabetes. The results suggest that administration of PS along with insulin would potentiate the insulin-induced hypoglycemia, and chronic administration of a carefully determined dose of PS would inhibit the development of STZ-induced diabetes.

Gupta et al suggested that long-term treatment with shilajit increases the number of cells of the pancreas, i.e. pancreatotrophic action, which may result in better sensitivity of pancreatic cells with prompt secretion of a large quantity of insulin in response to hyperglycemia[1].

Shilajit, a herbo-mineral preparation can thus offer a new and promising approach in the long-term management of maturity onset diabetes mellitus,

Reference
1. Gupta SS. Effect of Shilajit, Ficus Bengalensis & ant. Pituitary extract on glucose tolerance in rats. Indian J Med Res 1966; 54:354-66.

because of its multifaceted action. Since it can produce a better glycemic control along with improvement in the lipid profile in animals, it is worthwhile to try shilajit either as monotherapy or in combination with other antidiabetic agents clinically.

Studies done on the effects of shilajit during pregnancy

Ahamed et al from the Zoology Department, King Saud University College of Science, Saudi Arabia, conducted a study to assess the safety of shilajit during pregnancy[1]. The effect of shilajit on development of mice embryo was studied. The total of 71 pregnant females mice were given (250 and 500 mg/kg) orally via needle tube, daily from day 8-12 of pregnancy. All the treated and control animals show no differences in the number of the litter size, the placenta the body weight of the embryos, and the number of resorbed embryos at day 17 of gestation. However few abnormalities were observed in both treated and control groups

Shilajit was purchased from Riyadh city open market (as a paste, originated from India) and stored at 60^0 C. The fresh aqueous solution was prepared in distilled water for each experiment (250 mg/kg. and 500 mg/kg of the female body weight). Shilajit solution was administered orally (via force feeding tube) for five days starting from day eight of pregnancy.

Groups of female mice (SWR strain) were brought from animal house at College of Pharmacy, King Saud University. Females were housed with male (4+1) for mating in plastic cages in an environmentally controlled room with a temperature of 25 degree Celsius, 10 hours in light and 14 hours in dark. The animals were fed Pillsbury food and had free

access to water. Pregnancy was confirmed by presence of vaginal plug daily. The pregnant females were separated from others and that day was counted as day zero of pregnancy.

The pregnant female mice were divided into three groups, two treated, and one control group. The first group (24 females) were given

Reference

1. Ahmed R. Al-imaidi and Mohammed Umar.King Saud University college of Science. Zoology Department, Saudi Arabia. **Safe Use of Salajeet During The Pregnancy Of Female Mice**

250mg/kg of shilajit solution. The second group (20 female) were given 500 mg/kg of Shilajit solution. The third group is the control one (27 females) were given water only (vary from 0.02-0.05 ml as volume). Shilajit was administered orally (via force feeding tube) for five days starting from day 8 to 12 of pregnancy and. The females were dissected at day seventeen of pregnancy and number of litters, weight with placenta, number of resorbed embryo, and the weight gain in the females from day 8^{th} to 17^{th} day of pregnancy were studied. The embryos were checked for any morphological abnormalities in development.

The total of 71 pregnant female mice were studied, all the two treated and control group of animals show no differences in the mean number of the litter size. The placenta, the body weight of the embryos, and the number of dead embryos at day 17 of gestation (the day of dissections) showed no differences between the treated and control group. There was no difference in the female body weight gain (from day 8 to day 17 of gestation) between the treated groups (15-17 gm) and control group (17.5 gm).

Regarding the abnormal development of the embryos, in the treated group (250mg/kg) there was one embryo with a hernia and one with a

microcephaly. The (500 mg /kg) treated group showed only one embryo with abnormal eyes, while the control group showed one with ectopic pregnancy, one with excencephaly and one with a hernia.

Both treated and control group showed a few abnormally developed embryos This can be considered that they might occur normally , or due to some genetic abnormalities or other factors but not to the use of the Shilajit itself. Again the finding of this study is similar to the study done by Ghosal et al who had concluded that the use of Shilajit in the treatment of various diseases is not associated with any side effect on pregnancy and reproduction.

The results of this study confirm the safety of Shilajit. Due to the large molecular weight of the Shilajit compound, it is prevented from reaching the embryo by the placental barrier and it confirmed the fact that the Shilajit to be devoid of any teratogenicity.

This study has been done only in animals. The effect of shilajit during pregnancy has not been studied in human beings and no data is available regarding the safety of shilajit during pregnancy. There are no case reports from any where from the world about the developmental abnormalities that may result due to the intake of shilajit during pregnancy. Until conclusive evidence is available regarding the safety of shilajit during pregnancy, it is better to avoid it during pregnancy or use it only after consulting your doctor.

Studies on the functional and morphometric changes induced by shilajit

Shibnath Ghosal et al from the Department of Pharmaceutics, Banaras Hindu University, India conducted a study on Shilajit induced morphometric and functional changes in mouse peritoneal macrophages in 1994[1].

The dose-and-time-dependent effects of processed shilajit (SJP) on morphometric and functional changes of mouse peritoneal macrophages were

evaluated. Several dynamic aspects of cellular modulations were observed in response to SJP treatment (0.025-900 mcg per mouse, i.p.) for different periods of time (0 min to several hours). A plausible mechanism of drug-receptor interactions, involving different types of transition states, is postulated. Dose and time dependent bond formation-deformation in the complex transitions were

Reference

1. Shibnath Ghosal, Sraboni Baumik, Sukumar Chattopadhyay. **Shilajit induced morphometric and functional changes in mouse peritoneal macrophages.** Phytotherapy Research (May 1995), Volume 9, Issue 3 , Pages 194 – 198

reflected in the morphometric and functional manifestations of the adherent cells. These findings suggest the necessity of carefully determining the dose and period of administration of shilajit even when accepted as a panacea.

A similar study was done by Sraboni Bhaumik et al from Division of Biotechnology, Faculty of Engineering and Technology, Jadhavpur University, India and the Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, India[1]. The effect of processed shilajit (SJ-P) was evaluated on murine peritoneal macrophages and on the cohabiting fibroblasts. The study revealed a dynamic aspect of modulation of the peritoneal cells by SJ-P (200-600 mcg/mouse), when administered intraperitoneally. The findings further suggested that by carefully determining the dose, SJ-P can be used in wound healing and in related inflammatory disease states.

Studies done on the effects of Mumie (Russian shilajit) on bone formation

Cho Rok Jung et al from the Immunomodulation Research Center and Department of Biological Sciences, University of Ulsan, Korea and Altai State Technical University, Russia conducted a study on Osteoblastic differentiation of mesenchymal stem cells by mumie extract[2]. Mumie, a plant humus matter from rocks, is known as anabolic and a stimulator of bone regeneration in the Russian and Indian systems of health and medicine. The water-soluble fraction of mumie

from Uzbekistan was characterized using HNMR and infrared spectroscopic methods.

The mumie extract has been investigated for its effect on osteoblastic differentiation in cell culture assays of human and murine mesenchymal stem

Reference

1. Sraboni Bhaumik, Sukumar Chattopadhyay, Shibnath Ghosal. **Effect of Shilajit on Mouse Peritoneal Macrophages.** Phytotherapy Research (Dec 1993), Volume 7, Issue 6, Pages 425 – 427

2. Cho-Rok Jung, Igor A. Schepetkin, Sang B. Woo, Andrei I. Khlebnikov, Byoung S. Kwon. **Osteoblastic differentiation of mesenchymal stem cells by mumie extract.** Drug Development Research (Nov 2002). Volume 57, Issue 3, Pages 122 – 133.

cells. The calcium deposition and expression of alkaline phosphatase, osteocalcin, core binding factor 1 (Cbfa1), and ERK have been studied. During the 14-day assay period, human bone marrow mesenchymal stem cells (hMSCs) and human fetal osteoblasts cultured with mumie (3-5 μg/ml) underwent a dramatic change in cellular morphology, which was accompanied by a significant increase in alkaline phosphatase activity, calcium deposition, and osteocalcin expression.

The expression of core binding factor 1 and ERK were enhanced in hMSCs and murine pluripotent mesenchymal precursor cell line C2C12. Dose-dependent decrease in TRAP-positive multinucleated cell formation from macrophage-like cells RAW 264.7 was observed with increasing concentration of mumie in the presence of RANKL (40 ng/ml) and PD98059 (10 μM), a specific inhibitor of ERK activity. The data suggest that mumie is a potent stimulator of osteoblastic differentiation of mesenchymal stem cells and inhibitor of osteoclastogenesis, hence it maybe of clinical benefit in the treatment for osteoporosis in human.

Studies done on the effects of shilajit on biogenic free radicals

Bhattacharya et al from Department of Pharmacology, Institute of Medical Sciences, Banaras Hindu University, India and the Department of Pharmaceutics, Banaras Hindu University, India conducted a study on the effects of shilajit on biogenic free radicals in 1993[1]. The radicophilicity (antiradical-antioxidant effects) of processed shilajit (SJP) to oxygen-derived free radicals and nitric oxide (NO), and the attendant H_2O_2 cleaving effect were evaluated. Shilajit provided complete protection to methyl methacrylate (MMA) against

Reference

1. Salil K. Bhattacharya, Ananda P. Sen, Shibnath Ghosal. **Effects of shilajit on biogenic free radicals.** Phytotherapy Research (Feb 1995), Volume 9, Issue 1, Pages 56 – 59

hydroxyl radical-induced polymerization and acted as a reversible NO-captodative agent. Shilajit (20 and 50 mg/kg/day, i.p., for 21 days) induced a dose-related increase in super oxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX) activities in frontal cortex and striatum of rats. The data were comparable to those of deprenyl (2 mg/kg/day, i.p., for 21 days) in respect of SOD and CAT activities. These findings are consistent with the therapeutic uses of shilajit as an Ayurvedic rasayan (rejuvenator) against oxidative stress and geriatric complaints.

Yamini B. Tripathi from the Biochemistry Section, Department of Medicinal Chemistry, Institute of Medical Sciences, Banaras Hindu University, India investigated the effect of shilajit on lipid peroxidation and glutathione content in rat liver homogenate[1]. It inhibited lipid peroxidation induced by cumene hydroperoxide and ADP/Fe^{++} complex in a dose dependent manner. It also reduced the rate of oxidation of reduced glutathione content and inhibited ongoing lipid peroxidation, induced by these agents immediately after its addition to the incubation system.

Studies done on the effect of Shilajit in controlling allergic reactions

Allergic reactions occur when the inflammatory cells overreact to allergens. These are hypersensitivity reactions of the immune system. Type I hypersensitivity reaction is called anaphylaxis. Mast cells release histamine which is responsible for symptoms. The same chemical is responsible for the manifestations of various allergic disorders like asthma. Shilajit is known to prevent the release of histamine from the mast cells and thus prevent the onset of symptoms in allergic patients.

Reference

1. Yamini B. Tripathi, Savita Shukla, Savita Chaurasia, Shashikant Chaturvedi. **Antilipid Peroxidative Property of Shilajit.** Phytotherapy Research (May 1996), Volume 10, Issue 3, Pages 269 – 270

Shibnath Ghosal et al from the Department of Pharmacology, Institute of Medical Sciences, Banaras Hindu University, India and the Department of Pharmaceutics, Banaras Hindu University, India conducted a study on the Mast cell protecting effects of shilajit and its constituents in 1989[2]. The effects of shilajit and the combined effects of its main constituents, fulvic acids (FAs), 4′-methoxy-6-carbomethoxybiphenyl (MCB) and 3,8-dihydroxy-dibenzo-α-pyrone (DDP), were studied in relation to the degranulation and disruption of mast cells against noxious stimuli. Shilajit and different combinations of FAs, MCB and DDP provided statistically significant protection to antigen-induced degranulation of sensitized mast cells, markedly inhibited the antigen-induced spasm of sensitized guinea-pig ileum, and prevented mast cell disruption induced by compound 48/80. The findings are appraised in view of the clinical use of shilajit in the treatment of allergic disorders in Ayurvedic medicine.

Studies done on the effects of shilajit on genitourinary system

Prostate is a gland present in males along their urinary tract. The gland enlarges in size as the person becomes older causing obstruction to the urinary tract. This enlargement of prostate gland is called benign prostatic hyperplasia.

There are many drugs like finasteride which are very useful but not without any side effects. Shilajit is found to be very effective in the treatment of benign prostatic hyperplasia.

Andriukhova NN conducted a study on the treatment of benign prostatic hyperplasia using the Mumie (Russian shilajit) -Vitas preparation[2]. Overall thirty-eight patients presenting with stage I-II benign prostate hyperplasia received

Reference

1. Shibnath Ghosal, Jawahar Lal, Sushil K. Singh, Gautam Dasgupta, Joydeep Bhaduri, Mita Mukhopadhyay, Salil K. Bhattacharya. **Mast cell protecting effects of shilajit and its constituents.** Phytotherapy Research (1989), Volume 3, Issue 6 , Pages 249 – 252

2. Andriukhova NN. **The treatment of benign prostatic hyperplasia using the Mumie-Vitas preparation.** Lik Sprava. 1997 Nov-Dec ;(6):129-32.

treatment with a preparation called Mumiyo-Vitas, 0.2 g, on a once–or-twice daily basis over six months. Effects were studied of the compound on the urologic symptomatology and quality of life of patients presenting with ongoing micturitional disturbances, functional state of detrusor vesicae, prostate volume and urethral resistance. Efficiency of the treatment given was assessed by the International system, uroflowmetry, ultrasonic investigation. Mumiyo-Vitas appeared to be of therapeutic benefit in those patients with subjective and objective symptoms of the urinary bladder obstruction that had innocent prostate hyperplasia.

Studies done on the effects of Mumie (Russian shilajit) on the immune system

Schepetkin IA et al from the Immunomodulation Research Center, University of Ulsan, Korea conducted a study on the Characterization and biological activities of humic substances from mumie[1]. Mumie, a semi hard black resin formed by long-term humification, is believed to have therapeutic properties. Although mumie has been used in folk medicine since ancient times, there is little information available concerning the physicochemical properties of

its constituents and the mechanisms of its therapeutic efficacy. For this study, crude mumie was fractionated into fulvic acid (FA), humic acid (HA), humin, hymatomelanic acid, and two low molecular weight fractions (LMW1 and LMW2). The FA fraction was divided into five sub fractions, FA1-FA5. The mumie fractions were characterized by IR, UV-vis, and fluorescence spectroscopy. Total carbohydrate content in the fractions was analyzed using the phenol reaction method.

Reference

1. Schepetkin IA, Khlebnikov AI, Ah SY, Woo SB, Jeong CS, Klubachuk ON, Kwon BS. **Characterization and biological activities of humic substances from mumie.** J Agric Food Chem. 2003 Aug 27; 51(18):5245-54.

The relative content of polar groups and non-polar hydrocarbon fragments in the mumie fractions correlated well with solubility in an aqueous medium. Biological characterization was performed using only the FA fractions. FA1 and FA2 enhanced the production of reactive oxygen species (ROS) and nitric oxide in murine peritoneal macrophages, as determined with the use of 2', 7'-dichlorofluorescin diacetate and Griess reagent, respectively. The enhancement of ROS and nitric oxide production correlated with the level of total carbohydrates in the fractions. Murine splenic lymphocytes treated with FA1 showed a dose-dependent increase in [(3) H] thymidine uptake. These findings suggest that FA derived from mumie has immunomodulatory activity.

Arifkhanova SI conducted a study on the correction of immunologic deficiency in experimental tuberculosis and chronic effect of pesticides[1]. The paper deals with the findings of comparative morphologic and immunologic studies of immunomodulatory therapy for experimental tuberculosis on chronic exposure to pesticides (alpha-3) of 117 guinea pigs receiving decaris (levamisole), as an immunostimulator, and "mumiyo-acil" (Russian shiljait) , as a biostimulator. The specific features of every pathogenetic drug's effect on the tuberculous inflammation morphology, cellular-tissue reactions, cellular immune

response and repair processes were defined. An optimum effect in the treatment of the pesticide-induced experimental tuberculosis can be achieved by the use of anti-bacterial drugs and "mumiyo-acil".

Studies done on the effects of Mumie (Russian shilajit) on metabolic processes

Shvetskii AG et al conducted a study on the effect of the nonspecific biogenic stimulators pentoxyl and mumie on metabolic processes[2]. Nonspecific -

Reference

1. Arifkhanova SI, Vakhidova GA. **Correction of immunologic deficiency in experimental tuberculosis and chronic effect of pesticides.** Probl Tuberk. 1991 ;(5):61-4.

2. Shvetskiĭ AG, Vorob'eva LM. **Effect of the nonspecific biogenic stimulators pentoxyl and mumie on metabolic processes.** Vopr Med Khim. 1978 Jan-Feb; 24(1):102-8.

-biogenic stimulants (pentoxyl and mumie) accelerated metabolism of nucleic acids and protein in rat liver tissue. After the treatment with the stimulants the rate of lipolysis exceeded that of lipogenesis. Increase in content of lactate was similar if glycogen and glucose-6-phosphate were used as substrates of glycolysis, but it was stimulated 2-3-fold, when glucose was used; the phenomenon appears to be due to activation of hexokinase.

As shown by polarographic measurements mitochondrial respiration was increased in all the metabolic states, but increased doses caused an inhibition of phosphorylation apparently due to functional overstrain of mitochondria. Increased doses of the stimulants accelerated also some other metabolic processes studied, but the effects were not dose-dependent. Pentoxyl and Mumie apparently increased processes of protein and nuclei acid metabolism and stimulated the energy-providing reactions.

Chapter 4: Shilajit and Health

Decades of clinical research on shilajit has shown remarkable effects on humans. It increases longevity, improves memory and cognitive ability, reduces allergies and respiratory problems, reduces stress, and relieves digestive troubles. It is an anti-inflammatory, anti-oxidant, and it eliminates free radicals[1]. Shilajit increases immunity, strength, and endurance, and lives up to its ancient reputation as the "destroyer of weakness."[1]

In its raw form, Shilajit is a semi-hard, brownish black to dark, greasy, black resin that has a distinctive smell and taste[2]. Traditionally considered a panacea and a strong kidney tonic, it increases the core energy responsible for sexual desire and power, the same force that is withered by stress and anxiety[2]. Some of the health benefits of shilajit[3] include –

- Shilajit helps accelerate processes of protein and nuclei acid metabolism and stimulates energy providing reactions.
- Shilajit counteracts diabetes and regulates the blood sugar level.
- Shilajit purifies blood, improve functioning of pancreas and strengthen digestion.
- Shilajit reduces fat, dissolves tumors, and counteracts thirst.
- Shilajit promotes the movement of minerals, especially calcium, phosphorous, and magnesium into muscle tissue and bone.
- Shilajit stimulates the immune system
- Shilajit improves recovery after exercise
- Shilajit increases levels of growth hormone in diabetic patients
- Shilajit is a potent anti-ulcer agent

References

1. www.drhartman.com
2. www.chakrapaniayurveda.com
3. www.herbscancure.com

Shilajit's overall action is as a slight laxative, respiratory stimulant, disinfectant & expectorant, intestinal antiseptic, and it is a diuretic. It has been said in ancient Ayurvedic texts like Charak, that there is hardly any curable disease which cannot be assisted with the aid of Shilajit. General debility and fatigue is among the list of ailments which can be helped with Shilajit. There is also extensive mention of Shilajit as a powerful aphrodisiac and restorer of youthfulness in the Kama Sutra - the most widely read treatise on sex.

Shilajit has many healing properties. The basic mechanisms by which it brings about positive changes in health are –

- It restores the electrical potency of the cells in the body
- It effectively balances the energy metabolism
- It reduces the stress on the internal organs

Shilajit Patents

The health benefits of shilajit are so numerous and so effective that many corporations have begun to patent the various preparations of shilajit. A lot of patents have been submitted to the United States Patents & Intellectual Property Rights Department on Shilajit. Proofs were provided on various benefits of shilajit like its effectiveness in treating diabetes mellitus, preventing the effects of aging, its adaptogenic properties, and many others. All these claims have been verified, approved and patents have been issued by the United States Patent and Trademark Office[1].

There are two current patents on shilajit that have been approved by the United States Patent and Trademark Office[1]. They are –

- Patent number : 5405613
- Patent number: 6440436

Reference

1. www.rudramani.com

Patent 5405613[1]

This patent has been assigned to a vitamin and mineral composition of Creative Nutrition Canada Corp. (Uxbridge, CA).The inventor was David Rowland.

This is what the abstract says about his patented preparation –

'The product is a composition comprising Shilajit or an extract thereof in a vitamin and/or mineral preparation. Shilajit is a compact mass of vegetable organic matter, composed of a gummy matrix interspersed with vegetable fibers and minerals. Substances which have been identified in Shilajit include moisture, gums, albuminoids, calcium, potassium, nitrogen, silica, resin, vegetable matter, magnesium, sulphur, iron, chloride, phosphorous, iodine, glycosides, tannic acid, benzoic acid and a number of vitamins and enzymes. The invention further relates to a method to restore energetic balance or intensity, or to support or enhance a bioenergetic field in a mammal comprising administering to a mammal an effective amount of Shilajit or an extract thereof'.

The patent was applied on January 22nd 1993 and the patent was verified and approved on 11th April 1995. The claim was that the preparation is a composition comprising iron Shilajit in a multi vitamin and/or mineral preparation wherein the Shilajit is present in a concentration of between 0.4 and 10.0 per cent of the total weight of the composition and the multi vitamin and/or mineral preparation comprises vitamin A, Vitamin D, Vitamin E, Vitamin C, Vitamin B, Niacinamide, Pantothenic Acid, Folic Acid, Calcium, Magnesium, Potassium, Manganese, Zinc, and/or Selenium, and wherein the composition is in the form of a solid formulation for oral administration.

Reference

1. www.uspto.gov

The inventor of the preparation David Rowland has described the background of his invention as follows –

- The invention relates to the use of Shilajit or extracts thereof in vitamin and/or mineral compositions; to vitamin and/or mineral compositions containing Shilajit or extracts thereof; and, to methods to restore energetic balance or intensity, or to support or enhance a bioenergetic field in a mammal using Shilajit or extracts thereof

- In the Eastern world, a compound known as Shilajit (silajit) has a history of use as a folk remedy for various disorders, including genito-urinary diseases, diabetes, gall stones, jaundice, enlarged spleen, fermentative dyspepsia, worms, digestive disorders, piles, epilepsy, nervous disorders, eczema, anemia, anorexia, asthma etc. Shilajit has also been used as a tonic to help retain youthful vigor. Shilajit has been administered either by itself or in combination with certain other ayurvedic (herbal) medicines.

- Shilajit is a natural exudate ejected from rocks during hot weather in the lower Himalayas, Vindhya and other mountain tracts and Nepal, or it may be a tar formed in the earth from the decomposition of vegetable substances. Shilajit also contains benzoic acid, a compound which, along with its derivatives, has been used as a component of nutritional vitamin and mineral preparations.

- Shilajit over and above its nutritional and herbal content has novel energetic properties. Measurement of subtle energy changes indicate that Shilajit has a vibratory field that is substantially stronger than any vitamin, mineral, food substance or herb. Its vibratory field is also stronger than the vibratory fields of any of the known ingredients which

make up Shilajit, when these ingredients are tested as pure substances from non shilajit sources.

- When a small amount of Shilajit is added to a vitamin or mineral preparation, the energetic properties of the vitamin or mineral preparation are enhanced. In particular, the present inventor has found that the addition of a small amount of Shilajit to a vitamin or mineral preparation increases the energy field of the entire preparation to at or near the vibratory level of pure shilajit.

- The addition of Shilajit to vitamin or mineral preparations imparts to the preparations an energetic quality above and beyond their nutritional content. As well, the energetic quality of Shilajit-fortified vitamin and mineral preparations support or enhance a user's bioenergetic field.

The composition of the invention may be prepared by mixing the various components of the composition using conventional methods. In particular, the various components of the composition of the invention may be mixed in powder form and/or encapsulated and/or pressed into solid form preparations such as tablets or pills. The compositions of the invention are intended for administration to humans or animals.

Patent number: 6440436[1]

This patent has been assigned to a delivery system for pharmaceutical, nutritional and cosmetic ingredients Natreon Inc. (New Brunswick, NJ) Indian Herbs Research & Supply Company Ltd. (Saharanpur, IN). The inventor was Shibnath Ghoshal. This is what the abstract says about his patented preparation:

‘ The product is a stable, water-soluble delivery system of a purified Shilajit composition obtained by extraction of native Shilajit, containing at least 40% by weight of a carrier which is purified fulvic acid, characterized by having a sponge-like structure punctured by voids of about 200-1000 .ANG. in diameter, and a Mn molecular weight of about 700-2500; and an effective amount of an active pharmaceutical, nutritional or cosmetic ingredient added to said carrier and filling voids therein’.

The patent was applied for on 18th May 2001 and the patent was verified and approved on 27th August 2002.

It is a delivery system of wherein the active ingredient is selected from the group consisting of analgesics, anti-inflammatory agents, anthelminathics, anti-arrhythmic agents, anti-bacterial agents, anti-viral agents, anti-coagulants, anti-depressants, anti-diabetics, anti-epileptics, anti-fungal agents, anti-gout gents,

Reference
1. www.uspto.gov

anti-hypertensive agents, anti-malarials, anti-migraine agents, anti-muscarinic agents, anti-neoplastic agents, erectile dysfunction improvement agents, immunosuppressant, anti-protozoal agents, anti-thyroid agents, anxiolytic agents, sedatives, hypnotics, neuroleptics, beta-blockers, cardiac inotropic agents, corticosteroids, diuretics, anti-Parkinson agents, anticancer drugs, gastro-intestinal agents, histamine receptor antagonists, keratolytics, lipid regulating agents, anti-anginal agents, cox-2-inhibitors, leukotriene inhibitors, macrolides, muscle relaxants, nutritional agents, opioid analgesics, protease inhibitors, sex hormones, stimulants, muscle relaxants, anti-osteoporosis agents, anti-obesity agents, cognition enhancers, anti-urinary incontinence agents, nutritional oils, anti-benign prostate hypertrophy agents, essential fatty acids, non-essential fatty acids, sunscreens, antioxidants, anti-aging compounds and mixtures thereof.

The inventor of the preparation, Shibnath Ghosal, has described the background of his invention as follows –

- This invention relates to delivery systems for active ingredients, and, more particularly, to a water-soluble delivery system for pharmaceutical, nutritional and cosmetic active ingredients, which includes a purified Shilajit composition obtained by extraction from native Shilajit containing a carrier which is purified fulvic acid, and, wherein the active ingredient is added to and present in voids of the carrier.

- Native Shilajit is a blackish-brown exudation, of variable consistencies, obtained from steep rocks of different formations found in the Himalayas at altitudes between 1000-5000 m, from Arunachal Pradesh in the East, to Kashmir in the West. Shilajit also is found in other mountain ranges of the world, e.g. Afghanistan (Hindukush, Badakh-Shan), Australia (Northern Pollock Ranges), and in the former USSR (Tien-Shan, Pamir, Caucasus, and Ural). Native Shilajit is believed to arrest aging and also produce rejuvenation, two important attributes of an Ayurvedic rasayan medicine. Considerable controversy, however, has existed in the literature concerning the nature and chemical character of Shilajit. It has been variously described as bitumen (asphalt), a mineral resin, a plant fossil, a substance of mixed plant and animal origin, or an inorganic substance.

- Generally, native Shilajit contains two classes of organic compounds, namely, (a) humic substances and (b) non-humic organic metabolites. Humic substances are the major organic constituents of native Shilajit, present in an amount of about 80-85% therein; these substances have molecular weights ranging from several thousand for humic acids (HAs), to up to several million for polymeric humins (HMs) and only a few hundred for its fulvic acid component. Humic substances also are found in soils and sediments distributed over the earth's surface, occurring in almost all terrestrial and

aquatic environments. Sedimentary rock humic substances are produced by the interactions of marine fossils, plants, algae and mosses (bryophtes) with microorganisms, by a process known as humification. Humification of latex and resin-bearing plants is primarily responsible for the production of water-soluble humic substances.

- The non-humic substances of Shilajit are low molecular weight compounds of marine fossil, plant and microbial origin, occurring in and around Shilajit-bearing rocks. The remaining non-humic organic masses in Shilajit comprise a mixture of low M.sub.w aromatic, aliphatic alicyclic and heterocyclic (N- and S-containing) compounds. Of particular biological interest are low M.sub.w oxygenated dibenzo-.alpha.-pyrones (DBP) and hydroxyacetophenones (HAPs).

- The biological effects of Shilajit are believed to be due to the two distinct classes of bioactive compounds, namely: (i) DBPs, both mono- and bis-compounds thereof, in free and metal-ion conjugated forms; and (ii) fulvic acids (FAs) from Shilajit-humic substances, which function as a carrier for the bioactive DBPs. However, native Shilajit rhizospheres from different origins suffer from the presence of only small amounts of such bioactive compounds. Large amounts of contaminants, e.g. high M.sub.w polymeric quinones, humins (HMs), and inorganic substances; however, are present. Shilajit rhizospheres also are heavily infested at its periphery with a large array of microorganisms, some of which are producers of mycotoxins. Thus, the potential risk of ingesting Shilajit in its native form, or only after rudimentary purification, with no control or defined standards, is quite apparent.

- What is provided in this invention is a stable, water-soluble delivery system which includes
    - o A purified Shilajit composition preferably containing at least 40% by weight of purified fulvic acid carrier, obtained by extraction of native

Shilajit so that the fulvic acid carrier is substantially without bioactive components therein. The purified fulvic acid carrier is characterized by having a sponge-like structure punctured by voids of about 200-1000 .ANG. in diameter and a molecular weight, Mn, of about 700-2500, (Mn is a number average molecular weight)

- An active material - e.g. a water-insoluble ingredient, added to and filling voids in the purified fulvic acid carrier.

There are a few other inventions which are not patented by the United States patent and Trademark office.

Patent number 20030198695[1]

A herbo-mineral composition which includes a mineral-complexing agent which is purified Shilajit containing dimeric and/or oligomeric dibenzo-.alpha.-pyrones (DBPs), and, optionally, in synergistic combination with an extract of

Reference

1. http://www.freepatentsonline.com

Emblica officinalis containing gallo/ellagi-tannoids (GET), and, one or more added minerals, such as iron, copper or chromium. The composition in the example where the added mineral is iron is particularly effective in treating iron-deficiency anemia by rapidly absorbing ferrous iron into the blood stream without side effects.

Patent number WO2005041990[1]

The invention relates to a composition containing Shilajit or the extract thereof, which has the activity of enhancing the metabolic function of the entire body, resulting in an improvement in sexual function and an increase in reproductive function, and thus has effects on nutritional tonic, sexual function improvement, infertility treatment and the like.

Shilajit and anti-aging[2]

Aging is an inevitable process. From the time we are born, each and every cell in our body works relentlessly to carry out various important functions of the body. They assimilate the vital nutrients like proteins, carbohydrates, fat, minerals and vitamins. They utilize oxygen to carry out the cellular functions. During the process many unwanted substances called free radicals are formed. The free radicals and other toxic substances are eliminated from the body. These two important but entirely different functions of the body are called –

- Anabolism- where the calories are utilized for building up tissues
- Catabolism – where the tissues are broken down for recycling the vital nutrients and to excrete toxic metabolites

Reference

1. www.espacenet.com
2. www.rudramani.com

The central nervous system controls all these functions through nerve fibers. This is a well balanced activity. But as a person becomes older chronologically, the balance is disturbed. The assimilation of vital nutrients gets affected and the excretion of toxic metabolites is also hampered. This leads to the accumulation of various toxic substances including the free radicals which produces the various symptoms of aging.

Some physiology literature says that the vigor and performance peaks at 21 years in males and 18 years in females. After these ages, though the body functions well, it does not operate up to its full potential. And over the next couple of years and decades, slowly deteriorates, producing the symptoms of aging. The stress of Modern day life, pollution, lack of exercise and orientation towards junk food aggravates the process of aging & degeneration further.

Wrinkles on skin, thinning hair, receding hemlines and tendency to put on more weight in spite of consuming less food, decreasing energy & stamina, decrease in level of sexual life, susceptibility to major degenerative ailments are the signs that mean that the aging process is setting in our body. Many diseases occur as a result of aging. Some of the well known diseases of old age and aging which cause significant damage to the body are[1] –

- Diabetes – In this the glucose metabolism is affected and the high blood glucose damages almost all the vital organs in the body including heart, kidneys, nerves and eyes
- Hypertension – In this the blood pressure increases above the upper normal limit. Like diabetes , it damages almost all the vital organs in the body
- Dementia – In this the intellectual capacity is affected and the patient may suffer from memory loss and inability to carry out routine tasks

Reference
1. Harrison's Principles of Internal Medicine

- Alzheimer's disease – It is one of the causes of dementia, which is not treatable
- Osteoporosis – In this the matrix substance the calcium substance is decreased in the bones. These patients are more prone for fractures of the bones
- Osteoarthritis – In this the two opposing surfaces of the bones especially the weight bearing joints like knee joint get eroded leading to the deformity of the joint surface. This causes excruciating pain while walking
- Cancer – In this condition, the cells go out of control and multiply on their own, depleting the resources of the normal cells. Though some of them are treatable, most of the cancers have poor outcomes

- Parkinson's disease – This is another form of dementia which also has other symptoms like tremors, diminished voluntary movements
- Coronary artery disease – Coronary arteries are the blood vessels that supply blood to the heart tissue. In coronary artery disease, the blood vessels get blocked affecting the normal functioning of the heart. In severe cases, the patient succumbs to the disease

It has been said that most of the disease conditions occur as a result of a deficiency in minerals. Our body cells need minerals more than anything else if we have to arrest the natural degeneration process and stay young for a very long time. Minerals act as the catalysts for metabolic reactions and biological functions within the body and are required for the assimilation of all vitamins. Without minerals, vitamins are not of any use. Though many take mineral supplements, most of the time they are not fully effective. This is because most of the preparations are in the inorganic ion forms which are less effective. For a mineral to be very effective, it has to be supplied in the organic ion form.

Shilajit contains 85 types of minerals in natural ionic form which are very vital for maintaining the equilibrium of energy metabolism in our body[1]. The minerals in Shilajit are not similar to the mineral supplements available anywhere else. These minerals are in ionic form and have previously been absorbed by rich plant life and returned back to earth. So they are easily absorbed by the body cells.

Ghosal et al from the R and D Centre, Indian Herbs, Saharanpur, India did a comparative study on the ancient and the modern scientific findings of shilajit[2]. Comparison of the findings on the origin, chemical characters, purification, formulation, odor, and mechanism of biological actions of Shilajit of the ancient Ayurvedic texts (ca. 1000yr B.C. to 14th Century A.D.) and by modern scientific research, revealed several remarkable similarities not projected before. This review of the ancient Ayurvedic texts also brings forth a number of major

deficiencies in the hitherto reported Hindi and English versions of the ancient literatures on shilajit. The more important parallel findings of the ancient and the modern research bear directly on the purification and formulation of shilajit, and the ability of shilajit as a carrier of other drug molecules. The biological effects of shilajit revealed by modern research lend credence to its anti-aging and rejuvenating properties as claimed in Ayurveda.

One of the most important constituents of shilajit is fulvic acids. Fulvic acid is turning in to a health miracle of the 21st century. Scientists and doctors have turned their attention towards this wonder mineral and many have started doing extensive research on it. Fulvic acid found in shilajit is absorbed completely from the gut as opposed to the fulvic acid that is available commercially. Fulvic acid acts as carrier molecule and transfers many minerals across the cell membrane and makes them available for metabolic processes. Since all the minerals are made

Reference
1. www.ayurvediccure.com
2. S. Ghosal, J. P. Reddy, V. K. Lal. **Shilajit I: Chemical constituents.** Journal of Pharmaceutical Sciences (May 1976). Volume 65, Issue 5, Pages 772 – 773

available, the process of aging is delayed and sometimes even reversed. Shilajit can significantly reduce the chances of developing degenerative ailments like Cancer, Diabetes, heart diseases, osteoporosis, joint pains, and dementia.

Fulvic acid which is an important component of shilajit is believed to bring about rejuvenation in the following ways[1] –

- It increases the energy and stamina
- It increases the bioavailability of vital nutrients including minerals
- It transports the nutrients in to the cells
- It acts a powerful natural electrolyte
- It restores electrochemical balance
- It acts as an antioxidant and eliminates the free radicals which cause damage to the cells

- It increases the synthesis of DNA and RNA and increases the metabolism of proteins
- It activates various enzyme systems in the body which participate in important chemical reactions
- It boosts the immune system and prevents infection
- It acts as a chelator and removes heavy metals and other dangerous toxins from the body
- It keeps the essential nutrients in the active form for a longer period of time

In a nut shell, shilajit is effective in preventing and reversing aging process by –

- Providing 85 different minerals in the ionic form
- Fulvic acid transporting the various minerals across the cell for better functioning of the cell
- By maintaining the equilibrium between anabolism and catabolism

Reference
1. www.rpcshilajit.com

Shilajit and Urinary tract infection & kidney stones

Urinary tract infection is a common infection which manifests itself with burning micturition and lower abdominal pain. Urinary tract infection is more common among women than men. This is because their urethra is short, their urinary opening is very close to the anal opening from where it gets contaminated with bacteria, and also they don't have the protective secretion which men have from their prostate. The most common organism that causes urinary infection is the E coli.

Urinary infection is usually treated with antibiotics for 5-7 days, plenty of oral fluids and a urine alkalinizing agent. But these days this treatment is not successful in all the patients. This is due to the fact that the organism that causes

urinary tract infection develops resistance to the antibiotics that are used to treat the infection. Many patients resort to alternative treatment like herbal therapy for treating urinary tract infection nowadays. Shilajit is very effective in the treatment of urinary tract infection.

Shilajit was initially used to treat diabetes, genito-urinary diseases and for rejuvenation. Shilajit relieves the burning sensation associated with urinary tract infection[1]. It boosts the immunity and gets rid of the organism causing the urinary tract infection. Shilajit acts as a diuretic and flushes out the pathogenic organisms from the urinary tract.

Shilajit also dissolves stones that are formed in the kidney substance and along the urinary tract[1].

Reference

1. www.ayurvediccure.com

Shilajit and Diabetes mellitus

Diabetes mellitus is a group of metabolic diseases characterized by high blood sugar levels, which result from defects in insulin secretion, or action, or both. Diabetes mellitus commonly referred to as diabetes was first identified as a disease associated with “sweet urine. Elevated levels of blood glucose referred to as hyperglycemia lead to spillage of glucose into the urine, hence the term sweet urine.

Normally, blood glucose levels are tightly controlled by insulin, a hormone that is produced by the specialized cells of the pancreas. Insulin lowers the blood glucose level.

Insulin is released into the blood by beta cells (β-cells) in the pancreas in response to rising levels of blood glucose (e.g., after a meal). Insulin enables most body cells (about 2/3 is the usual estimate), including muscle cells and adipose tissue to absorb glucose from the blood for use as fuel, for conversion to other needed molecules, or for storage. Insulin is also the principal control signal for conversion of glucose to glycogen for internal storage in liver and muscle cells. Reduced insulin levels result both in the reduced release of insulin from the beta cells and in the reverse conversion of glycogen to glucose called gluconeogenesis when glucose levels fall.

In patients with diabetes, the insulin is either absent, relatively insufficient for the body's needs, or not used properly by the body. All of these factors cause elevated levels of blood glucose otherwise known as hyperglycemia. Diabetes affects 15 million people (about 8% of the population) in the United States. In addition, an estimated 12 million people in the United States have diabetes and are not yet diagnosed[1] .

Reference
1. www.mayoclinic.com

In 2006, according to the World Health Organization, at least 171 million people worldwide suffer from diabetes. Its incidence is increasing rapidly, and it is estimated that by the year 2030, this number will double. Diabetes mellitus occurs throughout the world, but is more common in the more developed countries Diabetes is the third leading cause of death in the United States after heart disease and cancer.

The prevalence of diabetes in persons 65 to 74 years of age is nearly 20%. Compared with 6% prevalence in Caucasians, the prevalence in African Americans and Asian Americans is estimated to be 10%, in Hispanics 15%, and in certain Native American tribes 20% to 50%.

There are two major types of diabetes -

- Type 1 diabetes or also called insulin dependent diabetes mellitus (IDDM), or juvenile onset diabetes mellitus
    - In type 1 diabetes, the pancreas undergoes an autoimmune attack by the body itself, and is rendered incapable of making insulin. Type 1 diabetes tends to occur in young, lean individuals, usually before 30 years of age, however, older patients do present with this form of diabetes on occasion
- Type 2 diabetes was also referred to as non-insulin dependent diabetes mellitus (NIDDM), or adult onset diabetes mellitus (AODM).
    - While it is said that type 2 diabetes occurs mostly in individuals over 30 years old and the incidence increases with age

Reference:
1. Harrison's Principles of Internal Medicine

The other types of diabetes are –

- Gestational diabetes - Blood sugar elevation during pregnancy is called gestational diabetes. Diabetes can occur temporarily during pregnancy.
- Secondary diabetes – This occurs due to other diseases like chronic pancreatitis, Acromegaly, Cushing syndrome etc

The mainstays in the treatment of diabetes mellitus are –

- Diet modification
- Exercise
- Oral anti-diabetic drugs
- Insulin injections

The faith in alternative medicine is rising very steeply and it is estimated that as much as 50% of the American people are using some form of alternative treatment. The alternative medicine for treating diabetes is basically divided in to two categories:

- Those that can control the blood sugar levels - minerals like chromium, magnesium, vanadium and zinc and plant foods like fenugreek seeds, peas, brewer's yeast, buckwheat, broccoli, garlic, ginger, ginseng, hawthorn, nettle and okra.

- Those that help in weight loss and thus indirectly control diabetes - extract of Hoodia gordonii, chitosan, camsogia garcinia, pyruvate, germander, Momordica charanta, Sauropus androgynus and aristolochic acid.

Shilajit has a unique mode of action and it is used for both prevention and treatment of diabetes mellitus. Ayurvedic system of medicine has been using shilajit for the treatment of diabetes for past 3000 years since the days of Sushrutha. Shilajit was initially used only to treat diabetes and genitourinary abnormalities till all its other uses were found out by scientists later.

Shilajit is especially useful in the treatment of Type II or the Maturity onset diabetes mellitus. It has got a multifaceted action. It not only reduces the blood glucose levels in the diabetic patients but also controls the blood lipids which are also increased in the patients with diabetes. High lipid levels make the patients more prone for heart diseases.

Many studies have been done on the effect of shilajit in treating diabetes and its signs and symptoms. The inference of some of the well known studies include-

- Shilajit produces a significant reduction in blood glucose levels and also produced beneficial effects on the lipid profile[1]. The maximum effect was observed with the 100 mg/kg/day dose of shilajit. Combination of shilajit (100 mg/kg) with glibenclamide (5 mg/kg/day) or metformin (0.5 gm/kg/day) significantly enhanced the glucose-lowering ability and improvement in lipid profile than any of these drugs given alone. The hypoglycemic effect of shilajit (100 mg/kg) is significantly higher than that of metformin (500 mg/kg). But the combination of shilajit with metformin produced no further significant reduction in the blood glucose level compared to that produced by shilajit (100 mg/kg) alone. Shilajit is thus very effective in controlling blood glucose levels and improves the lipid profile.

Reference

1. Goel RK, Banerjee RS, Acharya SB. **Antiulcerogenic and anti-inflammatory studies with shilajit.** J Ethnopharmacol. 1990 Apr; 29(1):95-103.

- Shilajit decreases the increased turnover of super oxide anion, as is reflected by the decreased demand of the enzyme super oxide dismutase (SOD). Up regulation of catalase activity in the initial phases perhaps obviates the need for antioxidant enzymes in later steps[1]. Overall, shilajit results in the reduction of lipids per-oxidation. Thus, processed shilajit may be of value as a dietary supplement for modulating diabetes status, as well as for the prevention of diabetes complications, which is a real challenge for the present-day diabetologist.

  Trasina (combination of Shilajit, Withania somnifera, Tinospora cordifolia, Eclipta alba, Ocimum sanctum and Picrorrhiza kurroa) had

little per se effect on blood sugar concentrations and islet SOD activity in euglycemic rats, in the doses of 100 and 200 mg/kg, p.o. administered once daily for 28 days. However, these doses of TR induced a dose-related decrease in STZ hyperglycemia and attenuation of STZ induced decrease in islet SOD activity. The results indicate that the earlier reported anti-hyperglycemic effect of TR may be due to pancreatic islet free radical scavenging activity, the hyperglycemic activity of STZ being the consequence of decrease in islet SOD activity leading to the accumulation of degenerative oxidative free radicals in islet beta-cells.

Reference

1. Nidhi Saxena, PHD, Upendra N. Dwivedi, PHD, Raj K. Singh, PHD, Arvind Kumar, MD, Chhavi Saxena, MSC, BAMS, Ram C. Saxena, MD and Mona Saxena, PHD. **Modulation of Oxidative and Antioxidative Status in Diabetes by Asphaltum Panjabinum.** Diabetes Care, 2003, 26:2469-2470.

2. Bhattacharya SK, Satyan KS, Chakrabarti A. **Effect of Trasina, an Ayurvedic herbal formulation, on pancreatic islet super oxide dismutase activity in hyperglycemic rats.** Indian J Exp Biol. 1997 Mar; 35(3):297-9.

- Long-term treatment with shilajit increases the number of cells in the pancreas, i.e. pancreatotrophic action, which may result in better sensitivity of pancreatic cells with prompt secretion of a large quantity of insulin in response to hyperglycemia[1].

Many people as said earlier are laying more trust on alternative medicine. Many combine the conventional treatment with complementary and alternative medicine (CAM). Shilajit which is considered a panacea is an alternative medicine for treating diabetes. Like most of the alternative medicine it is devoid of any serious side effects. Moreover it is very effective in controlling blood glucose, serum lipids and other complications of diabetes as per the various studies mentioned above.

Because of all these factors, shilajit can be tried alone or in combination with the conventional oral anti-diabetic drugs. One should always try to work with his/her physician to monitor the blood glucose level periodically while on shilajit, as they may develop decreased blood glucose levels during the treatment. This is more dangerous than the high blood glucose of diabetes mellitus. So the best thing to do is consult a doctor before starting on shilajit and to get his opinion periodically while on treatment with shilajit.

Reference

1. Gupta SS. Effect of Shilajit, Ficus Bengalensis & ant. Pituitary extract on glucose tolerance in rats. Indian J Med Res 1966; 54:354-66.

Shilajit and Parkinson's disease

Parkinson's disease is a disease of aging. This disease was originally described by James Parkinson and hence named after him[1]. There are two systems of nerve fibers in the brain –

- Pyramidal system
- Extra –pyramidal system

The pyramidal system controls the voluntary movements of the body. The extra-pyramidal system controls the involuntary functions like posture and equilibrium. Parkinson's disease is a disease of the extra pyramidal system. In this disease the nerve cells called the 'Nigro-striatal dopaminergic neurons' degenerate producing symptoms.

Parkinson's disease occurs mainly in the middle aged and elderly. It is one of the most common neurodegenerative diseases. It is estimated that 1-2% of those above 65 years of age are affected by this disease[1]. Symptoms start to

occur when 60-80% of the nerve fibers get degenerated. Parkinsonism is also seen as a complication of treatment with drugs like tranquilizers[1].

The signs and symptoms of Parkinson's disease are very striking and include the following[1] –

- Decreased movement of the body (bradykinesia) and difficulty in initiating voluntary movements. There is a decrease in associated movements like the normal unconscious movements such as swinging the arms during walking, the facial expressions related to emotional content of thought and speech

Reference
1. Review of Medical Physiology by William Ganong, 22nd edition

- Rigid body – The rigidity is called lead pipe rigidity and cog wheel rigidity
- Tremors – The tremors occur at rest. But when the person starts to use his limbs, the tremor disappears. The tremors occur at a rate 8 per minute

The extra-pyramidal system has two sets of nerve fibers which are in equilibrium. They are –

- Excitatory cholinergic fibers
- Inhibitory dopaminergic fibers

In Parkinson's disease, there is an imbalance between these sets of fibers resulting in the various signs and symptoms. The conventional treatment of Parkinson's disease include –

- L-Dopa
- Surgeries like pallidotomy, dopaminergic tissue implant
- Injection of neurotrophic factors

Though many different treatment options are available, in most of the cases the treatment has to be given life long with varying results. Alternative medicine like shilajit offers hope in these patients in reducing symptoms and improving the quality of life.

Studies conducted at the Paul Flechsig Institute for Brain Research, Department of Neurochemistry, University of Leipzig, Germany by Schliebs et al have found that shilajit is very useful in the treatment of Parkinson's disease. They administered shilajit at doses of 40 mg per kilogram body weight for 7 days. Administration of Shilajit led to reduced acetyl cholinesterase staining. In Parkinsons' disease, the cholinergic system is overactive and shilajit controls it and thus relieves symptoms. The results were better when shilajit was combined with Withania somnifera (Indian Ginseng)

Reference

1. Schliebs R, Liebmann A, Bhattacharya SK, Kumar A, Ghosal S, Bigl V. **Systemic administration of defined extracts from Withania somnifera (Indian Ginseng) and Shilajit differentially affects cholinergic but not glutamatergic and GABAergic markers in rat brain.** Neurochem Int. 1997 Feb; 30(2):181-90.

Another study conducted by Bhattacharya and Kumar from The Department of Pharmacology, Banaras Hindu University, India in 1997 to see the effect of Trasina, an ayurvedic herbal formulation[1]. Trasina is a combination of Shilajit, Withania somnifera, Tinospora cordifolia, Eclipta alba, Ocimum sanctum and Picrorrhiza kurroa. Trasina (200 and 500 mg/kg) was administered orally once daily for 21 days. The drug effectively controlled the cholinergic action in the brain. As said earlier increased cholinergic activity is one of the main causes of the symptoms in Parkinson's disease.

Thus shilajit can be used to control the disease process and relieve the symptoms in patients with Parkinson's disease, either alone or in combination with Withania somnifera.

Shilajit and Alzheimer's disease

Alzheimer's disease is also a disease of aging. Alzheimer's disease is a brain disorder named for German physician Alois Alzheimer, who first described it in 1906. The former president of the United States Ronald Reagan suffered from Alzheimer's disease. Alzheimer's disease is characterized by progressive loss of short term memory followed by general loss of cognitive and other brain functions, the need for constant care and eventually death.

It was originally characterized in the middle aged people. Alzheimer's disease is the most common cause of senile dementia accounting for 50-60% of the cases. It is present in about 17% of the population aged 65-69 years. Its incidence increases steadily with age and in those who are 95 years and older, the incidence is 40-50%[1].

Reference

1.Bhattacharya SK, Kumar A. **Effect of Trasina, an ayurvedic herbal formulation, on experimental models of Alzheimer's disease and central cholinergic markers in rats.** J Altern Complement Med. 1997 Winter; 3(4):327-36.

2. Review of Medical Physiology by William Ganong, 22nd edition

More than 5 million Americans now have Alzheimer's. Although symptoms can vary widely, the first problem many people notice is forgetfulness severe enough to affect their work, lifelong hobbies or social life. As the disease progresses, other symptoms include confusion, trouble with organizing and expressing thoughts, misplacing things, getting lost in familiar places, and changes in personality and behavior.

It is not clear what leads to the various signs and symptoms of Alzheimer's disease. Though brain changes like slowed thinking and memory loss is normal during the process of aging. But serious memory loss, confusion and other major changes in the way our minds work are not a normal part of aging. These indicate that the patient is developing Alzheimer's disease.

Two abnormal structures called plaques and tangles are prime suspects in damaging and killing nerve cells.

- Plaques – These contain deposits of a protein fragment called beta-amyloid
- Tangles – These are twisted fibers of another protein called tau

Though most people develop some plaques and tangles as they age, those with Alzheimer's tend to develop far more. The plaques and tangles tend to form in a predictable pattern, beginning in areas important in learning and memory and then spreading to other regions.

The signs and symptoms of Alzheimer's disease are divided in to two categories. They are –

- Cognitive symptoms – These affect memory, language, judgment, planning, ability to pay attention and other thought processes.
- Behavioral and psychiatric symptoms- These affect the way one feel and act. The patient may experience irritability or anxiety, depression, sleep disturbances, agitation, hallucinations ,delusions (belief in experiences or events that are not real)

Reference

1. Review of Medical Physiology by William Ganong, 22nd edition

The conventional treatment for Alzheimer's disease include the following drugs –

- Cholinesterase inhibitors like Donepezil, Rivastigmine, Galantamine
- Memantine
- Antidepressants
- Anxiolytics
- Anti-psychotics

Among the alternative shilajit is well known for its beneficial effects in arresting the progression and relieving symptoms of Alzheimer's disease. The following two studies proved the benefit of shilajit in treating patients with Alzheimer's disease –

- Schliebs et al from the Paul Flechsig Institute for Brain Research, Department of Neurochemistry, University of Leipzig, Germany conducted a study on shilajit to see its effects on the brain[1]. They confirmed the cognition-enhancing and memory-improving effects of shilajit. They attributed these effects to of shilajit on the cortical and basal forebrain cholinergic signal transduction cascade.
- Bhattacharya and Kumar from The Department of Pharmacology, Banaras Hindu University, India conducted a study in 1997 to see the effect of Trasina, an ayurvedic herbal formulation, on experimental models of Alzheimer's disease and central cholinergic markers in rats[2]. Frontal cortical and hippocampal ACh concentrations, ChAT activity and MCR binding was significantly reduced after colchicine treatment. Trasina (200 and 500 mg/kg) reversed these deficits after 14 and 21 days of treatment.

Reference

1. Schliebs R, Liebmann A, Bhattacharya SK, Kumar A, Ghosal S, Bigl V. **Systemic administration of defined extracts from Withania somnifera (Indian Ginseng) and Shilajit differentially affects cholinergic but not glutamatergic and GABAergic markers in rat brain.** Neurochem Int. 1997 Feb; 30(2):181-90.

2.Bhattacharya SK, Kumar A. **Effect of Trasina, an ayurvedic herbal formulation, on experimental models of Alzheimer's disease and central cholinergic markers in rats.** J Altern Complement Med. 1997 Winter; 3(4):327-36

Shilajit & Withania Somnifera combination has been proven to be extremely beneficial in healing, arresting and preventing brain degenerative ailments of Alzheimer's disease.

Shilajit as an aphrodisiac and fertility agent

Shilajit is being used by many as an aphrodisiac. An aphrodisiac is an agent which increases sexual arousal. The name comes from the Greek goddess of sensuality, Aphrodite. Throughout history, many foods, drinks, and behaviors have had a reputation for making sex more attainable and/or pleasurable. However, from a historical and scientific standpoint, the desired results may be

because their users have chosen to believe they will be effective (the placebo effect). Medical science has not substantiated claims that any particular food increases sexual desire or performance. However a fairly new drug called Bremelanotide seems to be the first real aphrodisiac. Its effect stimulates sexual desire in men and women, and clinical trials are currently testing it for the treatment of sexual arousal disorder and erectile dysfunction. Some of the well known aphrodisiacs include – Ashwaganda**,** Asparagus Chocolate Damiana Eurycoma longifolia Ginkgo biloba Ginseng Kava Maca, Mama Juana, Oysters, Yohimbene**,** Eringoes, Potatoes, Spanish fly, Rhinoceros Horn, Turtle eggs, Truffles, Fish Milt and Sea Cucumber[1]

There is also extensive mention of Shilajit as a powerful aphrodisiac and restorer of youthfulness in the Kama Sutra - the most widely read treatise on sex. Shilajit increases the sex drive. It increases the fertility of the person and increases the sperm count in men.[2]

Reference

1. www.wikipedia.org
2. Park JS, Kim GY, Han K. **The spermatogenic and ovogenic effects of chronically administered Shilajit to rats.** J Ethnopharmacol. 2006 Oct 11; 107(3):349-53

Shilajit is also well known for its effectiveness in the treatment of reproductive system related complaints for both, men and women. Its combination with Ashwagandha helps in rejuvenating the reproductive system. It also minimizes the debility or weakness in the sexual organs and helps in improving elongated sensual experience. It is also used to prepare various herbal oil preparations, which are used to massage the sexual organs, which increases sexual power[1].

There are a few studies done on the effects of shilajit on fertility. The following are some of the findings of the study –

- The study conducted by Park JS et al (October, 2006) from College of Pharmacy, Chungbuk National University, South Korea showed that in male rats the number of sperms in the testes and epididymides was significant higher than in the control[2].

- In the female rats, the effect of Shilajit was estimated by the ovulation inducing activity. Over a 5-day, ovulation was induced in seven out of nine rats in the Shilajit administration group and in three out of nine rats in the control.

- Shilajit had both a spermiogenic and ovogenic effect in mature rats.

Reference

1. www.natural-cure-guide.com

2. Park JS, Kim GY, Han K. **The spermatogenic and ovogenic effects of chronically administered Shilajit to rats.** J Ethnopharmacol. 2006 Oct 11; 107(3):349-53.

Shilajit – the Panacea

In Greek mythology, **Panacea** (Greek *Πανάκεια*, **Panakeia**) was the goddess of cures. She was the daughter of Asclepius, god of medicine, and the granddaughter of Apollo, god of healing (among other things).

Panacea and her five sisters each performed a facet of Apollo's art: Panacea was the goddess of cures, Iaso was the goddess of recuperation, Hygieia was the goddess of disease prevention, Aceso was the goddess of recovery, Meditrina was the goddess of longevity, and Aglaea was the goddess of natural beauty.

Panacea also had four brothers — Podaleirus, one of the two kings of Tricca, who had a flair for diagnostics, and Machaon, the other king of Tricca, who was a master surgeon

(these two took part in the Trojan War until Machaon was killed by Penthesilea, queen of the Amazons); Telesphoros, who devoted his life to serving Asclepius; and Aratus, her step-brother, who was a Greek hero and the patron/liberator of Sicyon.

Panacea was said to have a poultice or potion with which she healed the sick. This brought about the concept of the panacea.

- Improvement of memory –

Shilajit is used for improving memory and to support general mental functioning and for stress recovery. Contemporary research supports this traditional use. Schliebs et al from the Paul Flechsig Institute for Brain Research, Department of Neurochemistry, University of Leipzig, Germany conducted a study on shilajit to see its effects on the brain[1]. They confirmed the cognition-enhancing and memory-improving effects of shilajit. They attributed these effects to effect of shilajit on the cortical and basal forebrain cholinergic signal transduction cascade. They conducted the study in rats. They administered shilajit at doses of 40 mg per kilogram body weight for 7 days.

Shilajit has the property of crossing the blood brain barrier and enter the brain substance and protect the brain against free radical injury. Also there are chemical substances in the brain called the neurotransmitters which are essential for the normal functioning of the brain including the memory function. Some of the important neurotransmitters in this regard are acetyl choline (Ach) and L-DOPA. Acetyl choline gets metabolized by an enzyme called acetyl choline esterase. Shilajit inhibits this enzyme so that acetyl choline is not metabolized. This results in an increased level of acetyl choline in brain.

Shilajit also prevents L-DOPA from getting oxidized. Common memory lapses occur due to an imbalance of these powerful neurotransmitters. Shilajit helps in maintaining the balance of these chemicals and thus help improve memory.

Reference

1. Schliebs R, Liebmann A, Bhattacharya SK, Kumar A, Ghosal S, Bigl V. **Systemic administration of defined extracts from Withania somnifera (Indian Ginseng) and Shilajit differentially affects cholinergic but not glutamatergic and GABAergic markers in rat brain.** Neurochem Int. 1997 Feb; 30(2):181-90.

- As an antioxidant –

Shilajit is a significant anti-oxidant. It is very similar to procyanidins an anti-oxidant found in pine barks and grape seed extract. Oxidation is a process where electrons are transferred from a substance to another chemical called the oxidizing agent. During the process a lot of by-products called free radicals are formed. These free radicals can damage the tissues. An anti-oxidant is a substance which neutralizes these free radicals[1].

Shilajit acts as an anti-oxidant and prevents the damage caused by the free radicals. This anti-oxidant property of shilajit is utilized to treat memory disturbances, boost immunity and prevent the effects of aging process.

- As an anti-inflammatory agent –

Shilajit has been used traditionally to ameliorate inflammatory related conditions. Inflammation is the body's response to injury. This injury, or trauma, may be caused by a blow or wound, eye surgery, a disease such as a virus, bacteria infection, or a parasite. It is a process by which the body's white blood cells and chemicals protect us from infection and foreign substances such as bacteria and viruses. It is the body's attempt to rid itself of the cause of trauma, and to heal any damage caused by it.

Often, however, the inflammation itself can damage the body. When inflammation occurs normally, chemicals from the body's white blood cells are released to protect us from foreign substances. Sometimes, however, the white blood cells and their inflammatory chemicals cause damage to the body's tissues. In some diseases the body's defense system (immune system) inappropriately triggers an inflammatory response when there are no foreign

Reference

1. www.wikipedia.org
2. www.rpcshilajit.com
3. Robbin's Pathology of Diseases

substances to fight off. In these diseases, called autoimmune diseases, the body's normally protective immune system causes damage to its own tissues.

The body responds as if normal tissues are infected or somehow abnormal. Inflammation is characterized by pain, redness, swelling, warmth and loss of function.

Shilajit is a powerful anti-inflammatory agent. It prevents the unwanted side effects of inflammation. Many studies have shown that shilajit has significant anti-inflammatory properties. Goel et al has proved its anti-inflammatory effects in rats. In another study, shilajit was shown to reduce the swelling associated with inflammation by 76%.

Shilajit is also useful in the treatment of diarrhea, parasites or worm infections, digestive problems, jaundice, neurasthenia, epilepsy, stress, nervous depressions, skin diseases, respiratory problems such as asthma, bronchitis, anemia, menorrhagia, arthritis, obesity, hypothyroidism, gall stones, cancer, hypertension, healing of bone fractures, tuberculosis, and leprosy.[1]

Reference
1. www.rudramani.com

Chapter 5: Shilajit Preparations

Shilajit is obtained in crude form rocky terrains like the Himalayan Mountains. Though they have health benefits as found out by various studies, the shilajit extracted from the rocky terrains are not pure and they are mixed with many other substances of the region from where they are extracted which may sometimes be toxic also. Unpurified shilajit itself contains free radicals and fungal toxins[1].

Approximately 40% of the raw material remains after extraction. Proper extraction is very important to guarantee a consistent high level of active ingredients, remove inactive substances and harmful free radicals and mycotoxin producing fungi and fungal toxins[1]. Good quality Shilajit is then standardized to guarantee consistent levels of the active ingredients.

Shilajit has been marketed either alone or with other medicinal herbs and sometimes even with other minerals and vitamins depending on the purpose it has to serve. In a few preparations it has been used only for its carrier properties. Shilajit, a panacea of oriental medicine, collected from different countries, exhibits overtly different levels of bioactivity. According to Shibnath Ghosal et al from the Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, India and the Department of Pharmacology, Institute of Medical Sciences, Banaras Hindu University, India, there is a need for formulation of Shilajit by its isolated active constituents[2].

The effects of shilajit, collected from India, Nepal, Pakistan and Soviet Russia, and the effects of organic constituents isolated from a potent shilajit sample, were studied in a number of anti-stress and CNS activity paradigms.

Reference

1. www.drhartman.com

2. Shibnath Ghosal Jawahar Lal, Sushil K. Singh , Raj K. Goel, Arun K. Jaiswal, Salil K. Bhattacharya . **The need for formulation of Shilajit by its isolated active constituents.** Phytotherapy Research (Oct 1991), Volume 5, Issue 5 , Pages 211 – 216

Shilajit from Kumaon (India), Dolpa (Nepal), and a combination (1:1) of the total ethyl acetate extracts (TE) and fulvic acids, from Kumaon shilajit, produced statistically significant effects in forced swimming-induced immobility in albino mice; restraint stress and aspirin-induced gastric ulcers in pylorus ligated albino rats; and augmented the learning acquisition and memory retention in old rats. The potential risk of ingesting shilajit, in the native form as a 'health product', was appraised in view of its high stable free radical content and possible contamination with mycotoxin-producing fungi.

Hence, there is an imperative need for formulation of shilajit on the basis of its isolated active constituents (TE and fulvic acid). Additionally, the physical and spectral characteristics of active Fulvic acid (bioactivity-directed) were determined and compared with those of less active and inactive samples. These would provide predictability for selection of fulvic acid for formulation of shilajit.

Large amounts of contaminants like high polymeric quinones, humins, and inorganic substances are present. Shilajit rhizospheres also are heavily infested at its periphery with a large array of microorganisms, some of which are producers of mycotoxins. Thus, the potential risk of ingesting Shilajit in its native form, or only after rudimentary purification, with no control or defined standards, is quite apparent.

There are various methods of purification of shilajit each followed by various manufacturers. Some of the methods of purification are –

Method 1:[1]

The native crude shilajit is purified to make it rich in fulvic acid. A purified shilajit intended to be a water-soluble delivery system has the following features-

Reference

www.uspto.gov

- At least 40% by weight of purified fulvic acid carrier that is substantially without bioactive components therein. The purified fulvic acid carrier has a sponge-like structure punctured by voids of about 200-1000 ANG in diameter and a molecular weight, Mn, of about 700-2500, (Mn is a number average molecular weight)
- An active material, e.g. a water-insoluble ingredient, added to and filling voids in the purified fulvic acid carrier.

Fulvic acid is one of the most important constituents of shilajit. Fulvic acid in shilajit is absorbed completely from the gut than the fulvic acid that is available commercially. Fulvic acid acts as carrier molecule and transfers many minerals across the cell membrane and makes them available for metabolic processes. The steps of purification for this preparation of shilajit are –

- The shilajit extract is powdered
- The powdered shilajit is dissolved in water
- The dissolved shilajit is filtered to remove all the insoluble contaminants
- The filtrate is made in to a thick brown viscous residue by evaporating the water
- The residue is then extracted with a hot organic solvent like methanol to obtain a soluble fraction and an insoluble fraction containing the humus fraction
- Dilute NaOH is added to the insoluble Shilajit-humic fraction to precipitate polymeric quinones
- The alkaline filtrate is acidified to a pH of less than 3. This precipitates humic acids and leaves a brown acidic solution of fulvic acids
- The acidic solution is fractionated by passing it over a activated carbon to provide a solution of low-to-medium molecular weight fulvic acids

- The fulvic acid solution is passed through a H+ ion-exchange resin to concentrate the fulvic acids in solution
- The solution is finally evaporated to get a thick product

The product thus obtained contains fulvic acid of at least 40% and will be without any bioactive contaminants. The active material then is added to the carrier to fill voids in its structure, thus-forming the desired delivery system. Upon dissolution in water, the active ingredient is released to perform its intended active function, e.g. a pharmaceutical, nutritional or cosmetic function.

Some of the examples of the drug delivery system which employ fulvic acid in shilajit as a carrier molecule for delivering active ingredients are[1] –

- Purified Fulvic Acid-Glibenclamide Drug Delivery System
- Purified Fulvic Acid-Insulin Compositions
- Purified Fulvic Acid Pentazocin Compositions
- Skin Rejuvenating Lotion
- Sunscreen Lotion
- Maintenance Multivitamin Tablets
- Vitamin B-Complex Capsules
- Multi-Mineral Tablets
- Fulvic acid - Folic Acid Tablets
- Fulvic acid Coenzyme Q-10 Tablets
- Fulvic acid Coenzyme Q-10 Tablets
- Fulvic acid Folic Acid Syrup
- Fulvic acid Coenzyme Q-10 Suspension
- Fulvic acid Methotrexate Tablets
- Fulvic acid Mamoxiphen Citrate Tablets

Reference

1. www.uspto.gov

Method 2[1]:

This method is rather simple when compared to the above mentioned one. The steps include –

- The raw shilajit is extracted with water and iron shilajit is obtained
- The extracted Shilajit is then treated with a mixture of three herbs known as trifla, which includes amla (emblica officinalis), bahera (terminalia chebula), and haritaki (terminalia belerica), to remove possible contaminants.
- The purified Shilajit which is obtained is then dehydrated to remove moisture

The Shilajit produced and refined by this method is almost totally sterile. Laboratory analysis reveals that it has a bacterial count of only 50 colonies per gram and a yeast/fungus count of only 10 colonies per gram.

Shilajit is dispensed either alone or in combination of other drugs as mentioned above. According to Rowland who patented his invention, when a small amount of shilajit is added to a vitamin or mineral preparation, the energetic properties of the vitamin or mineral preparation are enhanced. The addition of Shilajit to vitamin or mineral preparations imparts to the preparations an energetic quality above and beyond their nutritional content. Also the energetic quality of Shilajit-fortified vitamin and mineral preparations support or enhance a user's bioenergetic field.

Shilajit is dispensed as capsules, tablets, syrups, elixirs, purified extract all these alone or in combination with active ingredients like vitamins, minerals or other drugs.

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1. www.uspto.gov

Frequently Asked Questions

What is Shilajit?

Shilajit is a pale-brown to blackish-brown exudation, of variable consistency, originating from layers of rocks in many mountain ranges of the world, especially the Himalayas and Hindukush ranges of the Indian subcontinent. It is also found in Afghanistan, Bhutan, China, Nepal, Pakistan, Tibet and some regions of the former USSR (Caucasus, Ural), as well as in Norway, where it is gathered in small quantities from steep rock faces at altitudes between 1000 and 5000 m. Its healing properties have been known for centuries.

According to Sanskrit literature, shilajit has been described as “Conqueror of mountains and destroyer of weaknesses.” In ancient India, it was considered a panacea for all diseases. It was believed that no major disease was curable unless and until shilajit was included in the drug preparation. Shilajit has been used for more than 3000 years now.

Shilajit is rich in minerals. Scientific research has shown that the active ingredients of shilajit consist of dibenzo-alpha-pyrones and related metabolites, small peptides (constituting non-protein amino acids), some lipids, and carrier molecules (fulvic acids). Standard shilajit contains at least 5-7% dibenzo-alpha-pyrones. Shilajit is being used to treat respiratory problems, diabetes, loss of libido, to prevent the effects of aging, and to boost the memory and immunity.

Are there different types of shilajit?

Initially there was confusion over whether shilajit is a herb, a mineral, or a fossil. Now research has shown that it is a herbo-mineral. It means shilajit essentially is composed of minerals that are accumulated due to decompostion of plant materials in the deeper layers of rocky terrains. The controversy

continued until the mid 1980s when it was finally established that shilajit contains plant extracts of recent origin. Most of the information about shilajit is from the research done by the scientists from the Banaras Hindu University. According to them, humification of resin-bearing plants was responsible for the major organic mass of shilajit - about 80 per cent of the humus component. The amount and composition of the remaining organic mass, which is a mixture of low molecular weight compounds, varies depending on where the shilajit comes from.

The composition of shilajit is influenced by factors such as plant species involved, geological nature of the rock, local temperature profiles, humidity and altitude. Although the composition varies from place to place, the physiological properties of shilajit are due to compounds such as the dibenzo-a-pyrones, along with triterpenes and phenolic lipids. Fulvic acids may also have a physiological role, acting as carrier molecules for the more bioactive smaller compounds. The highest level of therapeutic ingredients is obtained from the shilajit extracted in Nepal, especially those obtained at the altitudes of 12000 -13000 feet. Many distributors process these to make them healthier, and some even add ashwagandha, which adds to its benefits.

Ancient Hindu writers have mentioned four types of shilajit - Gold shilajit (red), Silver shilajit (white), Copper shilajit (blue) and Iron shilajit (blackish brown). Blue and red shilajit are not found commonly, as the most commonly available variety is iron shilajit. From the therapeutic point of view, it is considered to be the most active form. In addition, a few sources mention another type of shilajit called Russian shilajit, or moomiyo.

What is the dosage of shilajit that has to be taken?

Shilajit can be taken for both preventive health and for treating disease conditions like respiratory problems, stress, diabetes, allergies and loss of libido. It can also be used to boost memory, improve the immunity, to prevent the

effects of aging, and to enhance physical endurance. For preventive health it has to be taken in the dose of 300 mg per day. For treating diseases, it has to be continued for at least 6-8 weeks before seeing any benefits though many experience relief from the symptoms earlier than that. It has to be taken two times a day. This is because shilajit takes about 12-14 hours to reach maximum levels in the blood.

Traditional healers recommend starting the drug at a dosage of 300 mg in two divided doses per day, and slowly increasing the dose at the rate of 100 mg per day until the beneficial effects are obtained. Some have taken even up to 1000 mg in order to get good results.

Is shilajit a safe supplement?

Shilajit is an ancient medicine which has been under use for more than 3000 years now. It is one of the important components in the Ayurvedic system of medicine. The Ayurvedic system of medicine is one of the world's oldest medical systems. No side effects have been reported with the use of shilajit in any literature, even in the ancient literature related to Ayurveda.

Any one can take shilajit – young or old, healthy or sick. But not many studies have been done to clearly document the possibility of side effects. So it is better to consult the family physician before taking shilajit to know whether it is safe especially in those who are pregnant, those who breastfeed their babies and those who have serious illness and are under treatment for it.

People who have diabetes should monitor their blood sugar levels periodically if they plan to take shilajit. Shilajit is known to decrease the blood sugar levels and so is being used by diabetic patients who have high blood sugar levels. But since a low blood sugar level is also hazardous, these patients who are on shilajit should have to monitor their blood sugar levels to keep it under control.

How does shilajit act?

Shilajit is rich in minerals. The active principle of Shilajit is fulvic acid. In ancient India, it was considered a panacea for all diseases. It was believed that no major disease was curable unless and until, shilajit was included in the drug preparation. According to Sanskrit literature, shilajit has been described as “Conqueror of mountains and destroyer of weaknesses.”

In Ayurveda, shilajit is classified under ‘Rasayanas’ which are reputed to promote physical and mental health, improve defense mechanisms of the body, and enhance longevity. These attributes are similar to the modern concept of adaptogenic agents, which are known to afford protection to the human physiological system against diverse stressors. An adaptogen is a substance which helps normalize the body’s functions such as blood pressure, hormone levels, energy production, sleep/wake cycles and digestion.

The “modes of action” of shilajit include boosting the immune system, hormonal regulation, antioxidant, adaptogen, trace mineral source, antiseptic and it acts as a carrier for other supplements.

How does shilajit help in improving memory?

During the metabolism of the cells, many unwanted chemical substances called free radicals are formed. These free radicals damage the cells and affect the normal functioning of the cells. The deleterious effects of the free radicals are neutralized by chemical substances called anti-oxidants.

Shilajit acts as an anti-oxidant and neutralizes the free radicals. Shilajit has the property of crossing the blood brain barrier and entering the brain in order to protect it against free radical injury. Also, there are chemical substances in the brain called neurotransmitters which are essential for the normal functioning of the brain, including memory function.

Some of the important neurotransmitters in this regard are acetyl choline (Ach) and L-DOPA. Acetyl choline gets metabolized by an enzyme called acetyl choline esterase. Shilajit inhibits this enzyme so that acetyl choline is not metabolized. This results in an increased level of acetyl choline in the brain. Shilajit also prevents L-DOPA from getting oxidized. Common memory lapses occur due to an imbalance of these powerful neurotransmitters. Shilajit helps in maintaining the balance of these chemicals and thus helps improve memory.

How does shilajit boost the immune system and also prevent allergic symptoms?

There are three types of cells in the blood – red blood cells, white blood cells and platelets. Likewise there are five different types of white blood cells – neutrophils, basophils, eosinophils, lymphocyte and monocytes. White blood cells are related to immunity. They control infection by warding off the bacteria and viruses.

Likewise, over-activity of these cells results in allergic reactions. In allergic reactions, the basophils get converted in to mast cells and they open up to release histamine, which results in the various symptoms of allergies.

Shilajit, which is considered a panacea, improves immunity by increasing the activity of the white blood cells. The increased activity of white blood cells prevents bacteria and viruses from entering the blood stream. Shilajit also stabilizes the mast cells and prevents the release of histamine from them, thus preventing allergic symptoms. Thus shilajit, by these ways, boosts immunity and prevents allergies.

How does shilajit help in the healing of peptic ulcer?

A Peptic ulcer occurs in the stomach and duodenum. In a normal person, the mucosa of the stomach and duodenum are protected against the damage caused by acid by a layer of mucus. A Peptic ulcer occurs when the protective mucosal lining gets breached by the acid secreted within the stomach. Newer findings suggest that these ulcers result from an infection caused by bacteria called helicobacter pylori.

Shilajit helps in treating and preventing ulcers by increasing the secretion of the protective mucus. The increased mucus forms a coat along the walls of the stomach and the duodenum and prevents the formation of ulcers. It also hastens the healing of already formed ulcers.

How does shilajit prevent inflammation and its ill effects?

Inflammation is the body's response to injury. This injury, or trauma, may be caused by a blow or wound, eye surgery, a disease such as a virus, bacteria infection, or a parasite. It is a process by which the body's white blood cells and chemicals protect us from infection and foreign substances such as bacteria and viruses. It is the body's attempt to rid itself of the cause of trauma, and to heal any damage caused by it.

Often, however, the inflammation itself can damage the body. When inflammation occurs normally, chemicals from the body's white blood cells are released to protect us from foreign substances. Sometimes, however, the white blood cells and their inflammatory chemicals cause damage to the body's tissues. In some diseases the body's defense system (immune system) inappropriately triggers an inflammatory response when there are no foreign substances to fight off. In these diseases, called autoimmune diseases, the body's normally protective immune system causes damage to its own tissues. The body responds as if normal tissues are infected or somehow abnormal.

Inflammation is characterized by pain, redness, swelling, warmth and loss of function.

Shilajit is a powerful anti-inflammatory agent. It prevents the unwanted side effects of inflammation. Many studies have shown that shilajit has significant anti-inflammatory properties. Goel et al has proved its anti-inflammatory effects in rats. In another study, shilajit was shown to reduce the swelling associated with inflammation by 76%.

Is shilajit a significant anti-oxidant?

Yes, shilajit is a significant anti-oxidant. It is very similar to procyanidins, an anti-oxidant found in pine barks and grape seed extract. Oxidation is a process in which electrons are transferred from a substance to another chemical called the oxidizing agent. During the process, a lot of by-products called free radicals are formed. These free radicals can damage the tissues. An anti-oxidant is a substance which neutralizes these free radicals.

Shilajit acts as an anti-oxidant and prevents the damage caused by the free radicals. This anti-oxidant property of shilajit is utilized to treat memory disturbances, boost immunity, and prevent the effects of the aging process.

How long should shilajit be taken?

Shilajit is a herbo-mineral and is considered a panacea. It has to be taken at the dose of 300 mg per day in two divided doses. The drug has to be taken for 6-8 weeks before any benefit can be seen. But the onset and degree of response varies in different persons. The response depends on the health status of the person taking it.

It is said that people who are sick and down with diseases respond and show the benefits of taking shilajit faster than those who are in good health and taking shilajit. A few people show immediate effects, but ideally, the drug has to

be taken for 6-8 weeks. If you are sick, always ask your health care provider for advice in using shilajit.

What are the active ingredients of shilajit?

As stated earlier, initially there was confusion whether shilajit should be considered a herb or a mineral. But the research done on shilajit has proved that it is a herbo-mineral. It means that plants and other herbs in the region get buried deep under the rocks and get decomposed and form shilajit.

The active ingredients depend on the region from where shilajit is extracted and the plants which grow in that region. The active constituent of shilajit consists of dibenzo-alpha-pyrones and related metabolites, small peptides (constituting non-protein amino acids), some lipids, and carrier molecules (fulvic acids). Standard shilajit contains at least 5-7% dibenzo-alpha-pyrones. Research done on shilajit has shown that it is mainly composed of humus along with a few organic substances.

Humus is any organic matter which has reached a point of stability, where it will break down no further and might, if conditions do not change, remain essentially as it is for centuries or millennia. Humus consists of organic residues that have lost their original structure following rapid decomposition in the environment. Its composition changes constantly and it can disappear by slow decomposition unless new residual matter is incorporated. Among the various constituents of humus two are very important as far as shilajit is considered. They are fulvic acid and humic acid.

The humification of resin-bearing plants was responsible for the major organic mass of shilajit - about 80 per cent of the humus component. The amount and composition of the remaining organic mass, which is a mixture of low molecular weight compounds, varies depending on where the shilajit comes from. The most common low molecular weight compounds present are

oxygenated dibenzo-a-pyrones. So the composition of shilajit is influenced by factors such as plant species involved, geological nature of the rock, local temperature profiles, humidity, and altitude.

Where is shilajit extracted?

Shilajit is a form of mineral that drips from the cracks of the rocks during hot weather. It usually flows during the summer when the mountains get warm. It is the decomposition of plant matter in the rocks from thousands and ten of thousands of years in the past. The bio transformed plant matter is extruded from the rocks by geothermal pressures. It is collected in raw form for further purification.

Shilajit has been used for more than 3000 years now. It has been mentioned in ancient Ayurvedic texts like Charak. Shilajit is extracted from rocky areas especially the Himalayas and Hindukush ranges of the Indian subcontinent. It can be seen from Arunachal Pradesh in the east to Kashmir in the west. It is also found in Afghanistan, Bhutan, China, Nepal, Pakistan, Tibet and some regions of the former USSR (Caucasus, Ural), as well as in Norway, where it is gathered in small quantities from steep rock faces at altitudes between 1000 and 5000 m.

What is Momiyo?

Momiyo is the Russian variety of shilajit. A few resources say that Aristotle had vividly described the utility of Russian shilajit 2500 years ago. However, Russian shilajit or moomiyo was first introduced to this world in 1910. Various studies were done by National Science Laboratories using government funding in the Central Asian countries of Tajikistan and Uzbekistan. These are the countries where the extracts of moomiyo can be found.

Momiyo is a rare extract which is harvested only twice a year. It is also called Shilajit moomiyo extract, Russian Black anabolic extract, Mountain tear, Mountain blood, and Balsam of rock. Not much was known about this extract of

shilajit until 1990, when Russian scientists introduced it to the world. It has been used for more than four decades by the Russian cosmonauts, athletes, and military personal. It is well known for improving strength, muscle mass, and it also provides energy during recuperation.

What are the benefits of Russian shilajit?

The benefits of Russian shilajit include the following –

- It increases the life span
- It increases the strength and muscle mass and recuperative powers.
- It promotes healing of bone fractures
- It boosts the immunity

Why is Russian shilajit believed to increase life span?

The people of the Pamir Mountain Region in the Central Asia routinely use Moomiyo in their foods. Their life spans are 10 -15 years above the world average. This is proof that Russian shilajit can increase one's life span.

How does Russian shilajit increase strength and muscle mass?

Russian shilajit promotes rapid muscle growth by radical improvement in the activity of hormone glands. It improves one's workload by as much as 15-27% and dramatically shortens recovery time. It causes an up to 10 percent increase in the muscle mass. The Russian military and Russian athletes have been using this extract for more than four decades now.

Does Russian shilajit boost immunity?

Yes, Russian Shilajit boosts immunity. Research has shown that patients taking Moomiyo have significantly increased their concentration of T cells, highly specialized immune agents that fight diseases by attacking foreign microorganisms. Moomiyo helps white blood cells called macrophages work better and faster. The macrophage's job is to destroy and digest foreign material.

Moomiyo increases the production of Interleukin (IL-1), a protein that is released by the macrophages. Interleukin has important immune enhancing properties. IL-1 alerts the resting white blood cells when necessitated by the threats to the organism and spurs them into action.

Russian cosmonauts also use moomiyo as it facilitates a strong immune system, sound health, and fast recovery during and after long space journeys.

What are the types of shilajit that are mentioned in the ancient Hindu literature?

There are four different types of shiljait that are described in the ancient Hindu literature. They are –

- Gold shilajit (red)
- Silver shilajit (white)
- Copper shilajit (blue)
- Iron shilajit (blackish brown)

Among these the blackish brown iron shilajit is considered the most active form in terms of health benefits. Blue and red shilajit are not found commonly. Moreover, one should remember that the quality of shilajit differs in different areas depending on factors like plant species involved, geological nature of the rock, local temperature profiles, humidity and altitude.

Is shilajit used in the treatment of infertility?

Yes, shilajit is used in the treatment of infertility. Studies conducted by Park et al have shown that they increase the number of sperm cells. It also induces ovulation. Shilajit thus has both a spermiogenic and ovogenic effect.

Glossary

Acetyl Choline

Acetylcholine was one of the first neurotransmitters to be discovered. Acetylcholine (ACh) was discovered in the 1920s, making Acetylcholine (ACh) the first known neurotransmitter. This neurotransmitter can be found in the brain, neuromuscular junctions, spinal cord, and in both the postganglionic terminal buttons of the parasympathetic division of the autonomic nervous system and the ganglia of the autonomic nervous system. Acetylcholine (ACh) is synthesized from acetyl-CoA and Choline.

Adaptogen

An adaptogen is an ergogenic aid (performance-enhancing substance) derived from natural plants. They increase the body's resistance to stresses such as trauma, anxiety and bodily fatigue. In the past they have been called rejuvenating herbs, qi tonics, rasayanas, or restoratives. All adaptogens contain antioxidants, but antioxidants are not necessarily adaptogens and that is probably not their primary mode of action.

Alloxan

Alloxan is a crystalline oxidation product of uric acid. It induces diabetes experimentally by selective destruction of pancreatic beta cells. It is also known as mesoxyalyurea.

Antacids

Antacids are medicines that neutralize stomach acid. Antacids are used to relieve acid indigestion, upset stomach, sour stomach, and heartburn.

Antioxidants

Antioxidants are chemical compounds or substances that inhibit oxidation. They include substances such as vitamin E, vitamin C, or beta carotene, thought to protect body cells from the damaging effects of oxidation.

Ayurveda

Ayurveda is an ancient Hindu science of health and medicine.

Charaka Samhita

The Charaka Samhita is an ancient Indian manuscript, originating partly from early as 1000 BCE, on Ayurvedic internal medicine. It is believed to be the oldest of the three ancient treatises of Ayurveda. It is central to the modern-day practice of Ayurvedic medicine; and, along with the Sushruta Samhita it is now identified worldwide as an important early source of medical understanding and practice, independent of ancient Greece.

Colchicine

Colchicine is a poisonous, pale-yellow alkaloid, obtained from the autumn crocus and used in plant breeding to induce chromosome doubling and in medicine to treat gout.

Enzymes

Enzymes are any of numerous proteins or conjugated proteins produced by living organisms and functioning as biochemical catalysts.

Free radicals

Free radicals are atoms or group of atoms that has at least one unpaired electron and is therefore unstable and highly reactive. In animal tissues, free radicals can damage cells and are believed to accelerate the progression of cancer, cardiovascular disease, and age-related diseases.

Frontal cortex

Frontal cortex is part of frontal lobe which is the largest and most anterior part of each cerebral hemisphere.

Fulvic acid

Fulvic acid is one of two classes of natural acidic organic polymer that can be extracted from humus found in soil, sediment, or aquatic environments.

Glutathione peroxidase

Glutathione peroxidase is a selenium-containing enzyme that protects tissues from oxidative damage by removing peroxides resulting from free radical action, linked to oxidation of glutathione.

Himalayas

The Himalayas are a mountain range in Asia, separating the Indian subcontinent from the Tibetan Plateau. By extension, it is also the name of the massive mountain system which includes the Himalaya proper, the Karakoram, the Hindu Hush, and a host of minor ranges extending from the Pamir Knot.

Hippocampus

Hippocampus is a ridge in the floor of each lateral ventricle of the brain that consists mainly of gray matter and has a central role in memory processes.

Humus

Humus is a brown or black organic substance consisting of partially or wholly decayed vegetable or animal matter that provides nutrients for plants and increases the ability of soil to retain water.

Hypothyroidism

Hypothyroidism, or under active thyroid, develops when the thyroid gland fails to produce or secrete as much thyroxin (T_4) as the body needs. Because T_4 regulates such essential functions as heart rate, digestion, physical growth, and mental development, an insufficient supply of this hormone can slow life-

sustaining processes, damage organs and tissues in every part of the body, and lead to life-threatening complications.

Ibotenic acid

Ibotenic acid is a chemical compound that is naturally occurring in the mushrooms Amanita muscaria and Amanita pantherina, among others. Ibotenic acid is a potent neurotoxin that is used as a brain lesioning agent and has shown to be highly neurotoxic when injected directly into the brains of mice.

Interleukin

In immunology interleukin denotes any of the class of proteins that are secreted mostly by macrophages and T lymphocytes and induce growth and differentiation of lymphocytes and hematopoietic stem cells

Kamasutra

Kamasutra is a Sanskrit treatise setting forth rules for sensuous and sensual pleasure, love, and marriage in accordance with Hindu law.

Lipids

Lipids is any of a group of organic compounds, including the fats, oils, waxes, sterols, and triglycerides, that are insoluble in water but soluble in non-polar organic solvents, are oily to the touch, and together with carbohydrates and proteins constitute the principal structural material of living cells.

Buddha

Buddha is the founder of Buddhism and who is worshipped as a god.

Shiva

Shiva is one of the principal Hindu deities, worshiped as the destroyer and restorer of worlds and in numerous other forms. Shiva is often conceived as a member of the triad also including Brahma and Vishnu.

Macrophages

Macrophages is a large scavenger cell, common in connective tissue and certain body organs, where it engulfs and destroys bacteria, and other foreign debris. Macrophages are also involved in the immune response.

Menorrhagia

Menorrhagia is abnormally heavy or extended menstrual flow.

Mesenchyme

Mesenchyme is the part of the embryo, consisting of loosely packed, unspecialized cells set in a gelatinous ground substance, from which connective tissue, bone, cartilage, and the circulatory and lymphatic systems develop.

Mount Kailash

Mount Kailash is a peak in the Gangdise mountains in China, the source of some of the longest rivers in Asia—the Indus River, the Sutlej River, a tributary of the Indus River, and the Brahmaputra River—and is considered as a sacred place in four religions—Hinduism, Buddhism, Jainism and Bon faith. Hindus believe that it is an abode of Lord Shiva.

Mycotoxins

Mycotoxins are toxins produced by fungus.

Osteoblast

Osteoblast is a cell from which bone develops.

Pancreas

Pancreas is a long, irregularly shaped gland in vertebrates, lying behind the stomach, which secretes pancreatic juice into the duodenum and insulin, glucagon, and somatostatin into the bloodstream.

Peptic ulcer

Peptic ulcer is an ulcer involving the mucosa, sub mucosa, and muscular layer on the lower esophagus, stomach, or duodenum, due in part at least to the action of acid-pepsin gastric juice.

Peritoneum

Peritoneum is the serous membrane that lines the walls of the abdominal cavity and folds inward to enclose the viscera.

Phytochemicals

Phytochemicals is a nonnutritive bioactive plant substance, such as a flavonoid or carotenoid, considered to have a beneficial effect on human health.

Rhizospheres

Rhizospheres are the soil regions subject to the influence of plant roots and characterized by a zone of increased microbiological activity.

Seminiferous tubules

Seminiferous tubules are any of the tubercles of the testes which produce spermatozoa.

Stem cells

Stem cells are unspecialized cells that give rise to specific specialized cells, such as blood cells.

Streptozocin

Streptozocin is an antibiotic produced by an actinomycete (Streptomyces achromogenes) and active against tumors but damaging to insulin-producing cells and now also regarded as a carcinogen

Super oxide dismutase

Super oxide dismutase is an enzymatic antioxidant that removes the potentially toxic super oxide ion by disproportionating it to O_2 and hydrogen peroxide.

Sushruta Samhita

The Sushruta Samhita is a Sanskrit text on surgery, attributed to Sushruta (lived in ca. the 6th century BC).

T cells

T cells originate in the bone marrow but mature in the thymus (the t stands for thymus). T-cells attack other body cells that are infected by some bacteria, a virus, or another pathogen.

Teratogenicity

Teratogenicity means the development of defects in an embryo.

Tethys Sea

The Tethys Sea or Ocean was a Mesozoic era ocean that existed between the continents of Gondwana and Laurasia before the opening of the Indian Ocean.

Resource Guide

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For further reading

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Images

Figure 1: Shilajit rock

Courtesy:http://www.sdrshilajit.com

Figure 2: Shilajit rock

Courtesy:http://www.sdrshilajit.com

Figure 3: Shilajit extracts

Courtesy: http://www.herbalprovider.com

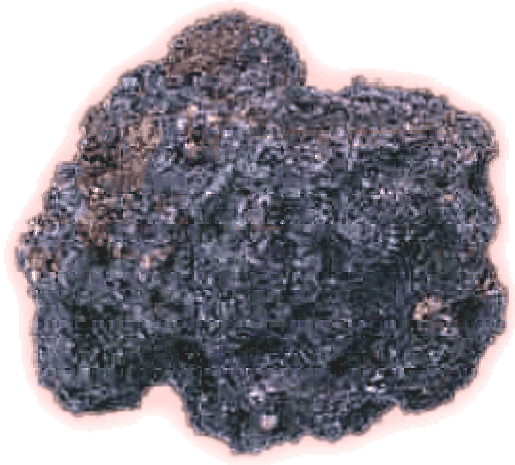

Figure 4: Shilajit extract

Courtesy:http://www.altcancer.com

Figure 5: Black shilajit oozing from the rocks

Courtesy: http:// www.ayurveda-herbs.com/17-Shilajit.jpg

Image 6: Shilajit rocks

Courtesy: http:// www. dehlvi.com/.../ingradient/shilajit2.jpg