

**FROM MOUNTAINS TO MEDALS - *SHILAJATU* ROLE IN
ELEVATING ATHLETIC EXCELLENCE – A REVIEW**

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ABSTRACT

Introduction: Muscle is a defining characteristic of elite athletes. Its size, efficiency, strength, and flexibility all play crucial roles in athletic performance. These adaptations vary depending on the specific sport. Just like any structure, muscles require the right building blocks to function optimally. Collagen, a protein that makes up about 30% of all human proteins, is a key building block for muscles. It boasts remarkable tensile strength, exceeding even that of steel. This protein is essential for muscle function, contributing to flexibility, strength, and adaptability. *Shilajatu* is a resinous substance found in the rocks of the Himalayan mountains. During the summer months, it trickles down from these peaks. Recent studies have revealed its exceptionally high antioxidant value, measured by the ORAC score. The Ayurvedic text *Rasaratnasamucchaya* mentioned different *Shodhana Dravya* for *Shodhana* of *Shilajatu*. One such method involves *Goksheera Swedana*. This process not only purifies *Shilajatu* but also enhances its *Rasayana* properties. Additionally, it promotes *Bala*, regulates mitochondrial function. **Methodology:** All the classical texts in

Ayurveda & modern literature were referred. **Result:** In *Ayurveda* many *Dravyass* mentioned as *Balya*. Detailed study of *Shilajatu* creates a great scope in *Ayurveda* for boosting athletic performance. **Discussion:** Maintaining body strength is not an easy task for athletes. But taking this *Shilajatu* as *Rasayana* helps the athletes to get good muscle health & along with

body strength. A detailed study of *Shilajatu* will create a new scope in *Ayurveda* in the field of sports health.

KEYWORDS: *Shilajatu*, *Balya*, *Rasayana*, Sports Health, Muscle strength.

INTRODUCTION

Sports medicine is a branch of medicine that deals with physical fitness, the treatment & prevention of injury related to sport and exercise. Its function is not only curative and rehabilitative, but also preventative, which may actually be the most important one of all.^[1] *Ayurveda* plays a significant role in preserving the health of athletes, offering a multitude of herbal remedies and treatments as mentioned in its texts to support the well-being of athletic individuals. *Shilajatu*, literally meaning "rock essence", is a mineral composed of two words: *Shila* (rock/mountain) and *Jatu* (resin-like substance). It is regarded as a *Maharasa* in *Ayurveda*. This resinous material trickles down from the rocks of the Himalayas during the summer months. The essence that collects between the rocks after oozing out and drying up is called *Shilajatu*.^[2] The increased summer temperatures are believed to contribute to the exudation of this thick, resinous essence from the rocks. It contains fulvic acids as the main components along with free and conjugated dibenzo- α -pyrones (DBPs; Urolithins) & more than 85 minerals in ionic form including Triterpenes & aromatic carboxylic acids as well as humic acids and some of oligoelements including Selenium. It is included as an ingredient in a number of currently available nutritional supplements in sports health.^[3]

Recent studies have highlighted the exceptionally high antioxidant properties of *Shilajatu*, as measured by the ORAC (Oxygen Radical Absorbance Capacity) score.^[4] Research studies have reported that supplementation with *Shuddha Shilajitu* increased adenosine triphosphate (ATP) availability via improved mitochondrial function in mice and increased free testosterone, total testosterone, and dehydroepiandrosterone by 19-31% in healthy men, which promotes increases in lean mass and muscular strength.^{[5][6]} Thus, *Shilajatu* may have a beneficial effect on exercise performance by enhancing metabolic characteristics and potentially increasing muscle mass and strength.

MATERIALS AND METHODS

Information will be collected from Ayurvedic classical texts, relevant contemporary books, along with electronic database with the pertinent past and present research works.

Classical *Ayurvedic* texts, including *Samhitas*, *Chikitsa Granthas*, *Nighantus*, and *Rasa Granthas*, all admire *Shilajatu* for its *Rasayana*, *Balya*, and *Yogavahi* properties.

Table No. 1: *Shilajatu* is categorized into various types.^[7]

Based on its origin	Based on its appearance	Based on its processing method
<i>Swarna</i> (gold)	<i>Gomutra</i> (cow urine-like)	<i>Suryatapi</i> (sun-purified)
<i>Rajata</i> (silver)	<i>Karpura Gandhi</i> (camphor-scented)	<i>Agnitapi</i> (fire-purified)
<i>Tamra</i> (copper)	-	-
<i>Loha</i> (iron)	-	-
<i>Naga</i> (lead)	-	-
<i>Vanga</i> (tin)	-	-


Shodhana – This process removes impurities and enhances its therapeutic properties. **Shodhana Dravyas** are used for purification, including: *Kshara*, *Amla*, *Gojala*, *Goksheera*, *Triphala kwatha* & *Bhringaraja swarasa*.^[8]

METHOD: *Ashuddha Shilajatu* is continuously washed with the chosen *Shodhana dravya* in a vessel. The filtrate is then collected in trays and dried under sunlight, resulting in *Shuddha shilajatu*.^[8]

Specific *Shodhana dravyas* can be chosen for desired effects. For example, *Kshara*, *Amla* & *Gomutra* with its alkaline properties, is believed to have "*Lekhana*" action. This action helps eliminate *Apachita dhatu mala* (unwanted substances) from the body. Additionally, the alkaline environment created by the *Shodhana dravyas* might be unfavorable for abnormal cell growth, does *Lekhana Karma*. However, more scientific research is needed to confirm this definitively. When *Goksheera*, *Triphala* are used as the *Shodhana Dravya*, it's believed to exhibit *Vatanulomana* (balances *Vata dosha*), *Srotoshodhana* (cleanses channels), and *Rasayana* (rejuvenative) effects and imparts *Bala* (strength) to the body. Consuming this *Goksheera Shodhita Shilajatu* along with *Goksheera* as *Pathya* is said to promote *Jaravyadhi Prashamana* (manages aging-related conditions), *Medhya* and *Smritikara* (improves intellect and memory), *Dehadadya Karaka* and *Balya* (improves bodily strength).^[9]

Maatra: The general dosage of *Shuddha Shilajatu* – 2 to 8 *Ratti* (250mg-1gm). However, the dosage has to be finalised after thorough consideration of all the relevant factors like *Bala*, *Kala*, etc., that affect the dosage.^[7]

Table No. 2: Composition of *Shilajatu*.^[10]

<i>Shilajatu</i>		
Triterpenes	Humic substances	Dibenzo- α -pyrones
		
Humic substances		
Humic acid	Fulvic acid	Humins

Shilajatu contains 85+ minerals in ionic form, vitamins, fulvic acid and very important phytonutrients. The fulvic acid in *Shilajatu* is in its most natural and purest form. This alone can transport the minerals through the thick cell walls and can instantly supply them to the cells. It can effectively prolong cell life and keep it healthy for a very long time. As per recent researchers it has unique composition as a phytocomplex, very rich in fulvic acid, and also, they have hypothesized that *Shilajatu* is produced by the decomposition of plant material from species such as *Euphorbia royleana* and *Trifolium repens*. This decomposition seems to occur through centuries, and on this basis, *Shilajatu* is considered a millenary product of nature.^{[10][11]}

Table No. 3: *Shilajatu* alone can be prescribed in different disease conditions.^[12]

Conditions	Along with
<i>Raktapitta</i>	<i>Yashtimadhu Kashaya</i>
<i>Karshya</i>	<i>Goksheera</i>
<i>Medovrddhi</i>	<i>Jala mishrita madhu</i>
<i>Mutravahasrotovikara</i>	<i>Veeratarvaadigana Kashaya / Vangabhasma+Ela+Vamshalochana+Madhu</i>
<i>Kushta</i>	<i>Khadhira Kashaya</i>
<i>Prameha</i>	<i>Vangabhasma+Goksheera</i>
<i>Veeryavrdhi</i>	<i>Kakolyadigana Kashaya</i>
<i>Pandu</i>	<i>Triphala+Loha bhasma / Salasaradigana Kashaya</i>
<i>Jwara</i>	<i>Musta & Parpata Kashaya</i>
<i>Kshaya</i>	<i>Swarnamakshikabhasma+Lohabhasma+Trikatu+Madhu</i>

Table No. 4: Duration of administration of *Shilajatu*.^[13]

<i>Rogavastha</i>	Duration
<i>Prabala</i>	<i>Sapta saptaha/49days</i>
<i>Madhyama</i>	<i>Traya saptaha/21days</i>
<i>Avara</i>	<i>Eka saptaha/7days</i>

What has to be avoided: *Kulattha* should be strictly avoided while consuming *Shilajitu*. Consuming *Kulattha* alongside *Shilajatu* can hinder its absorption due to its *Ashma bedhana*

property, leading to *Shilajitu* being expelled from the body. It is also recommended to avoid *Vidahi* and *Guru Aahara* while taking *Shilajatu* for optimal results.^[14]

DISCUSSION

Shuddha Shilajatu possesses *Tikta, Katu & Kashaya Rasa, Ushna Veerya, Katu vipaka*. It is having *Mutrala* (diuretic), *Yogavahi* (synergistic) & *Rasayana* (rejuvenation) property.^[15] It is a source of *Srotoshodhana*, nourishes *Dhatu*, enhances the *Indriya & Buddhi*, acts as *balya, Varnakara, Vrishya, Kapha medha shoshana, Malacchedhana*. The consumption of *Shuddha Shilajatu* effectively eradicates the *Vyadhis* such as *Prameha, Kushta, Unmada, Apasmara, Shula, Shosha, Gulma, Pandu, Kshaya*, helps in eliminating the longstanding urinary calculi and all types of skin diseases.^[16] It possesses the qualities similar to *Rasa, Uparasa, Sutendra, Ratna*, etc., which have the power to conquer the aggravated fatal diseases.^[16] रसोपरस-सूतेन्द्र रत्न-लोहेषु ये गुणाः । वसन्ति ते शिलाधातौ जरा-मृत्यु-जिगीषया ॥ It is beneficial for *Bala, Yuva, Vriddha, Stree, Purusha & Sagarbha prasuta*.^[16]

Table No. 5: Based on Gunas Shilajatu action.^[16]

Sl. No.	Gunas	Acts as
1.	Due to Sneha & Lavana	Vatagna
2.	Sara	Pittagna
3.	Teekshna	Kaphagna & Medhogna
4.	Ushna, Teekshna	Deepana
5.	Snigdha	Poushtika, Balya, Aayushya vardhaka, Vrishya, Vishanashaka, Satvavardhaka
6.	Tikta Rasa	Raktavikara nashaka

Table No. 6: Shilajatu Guna increased based on the drugs used for Bhavana.^[16]

Sl. No.	Drugs for Bhavana	Dosha Karma
1.	Rasna, Dashamula, Khadira, Punarnava, Eranda, Shunti	Vataroga Shamana
2.	Kashaya of Draksha, Shatavari, Mallika pushpa, Trayamana, Guduchi, Jeevaniya gana	Pittaroga Shamana
3.	Kashaya of Triphala, Vacha, Vayuvidanga, Karanja, Brihat Panchamula	Kapharoga Shamana
4.	Kashaya of Laghu Panchamula, Shunti, Draksha, Gambhari, Ashwagandha, Guduchi Hima & Khadira Hima	Vatapitta Shamana
5.	Kashaya of Panchakola, Haridra, Ativisha, Kushta, Vacha	Vatakapha Shamana
6.	Infuse Shilajatu with Kashaya of Pata, Nimba, Triphala, Saptaparna, Guduchi	Pittakapha Shamana

When *Goksheera* is used as the *Shodhana Dravya*, it's believed to exhibit *Vatanulomana* (balances Vata dosha), *Srotoshodhana* (cleanses channels), and *Rasayana* (rejuvenative) effects and imparts *Bala* (strength) to the body. Consuming this *Goksheera Shodhita Shilajatu* along with *Goksheera* as *Pathya* is said to promote *Jaravyadhi Prashamana* (manages aging-related conditions), *Medhya* and *Smritikara* (improves intellect and memory), *Dehadadya karaka* and *Balya* (improves bodily strength).^[9]

Athletes are continuously seeking different ways to enhance their strengths for their performances in sports. Most of the supplements are available yet, one natural substance stands out for its potential benefits i.e, *Shilajatu*. This is one of the potent natural substance due to its rich composition of organic compounds. One of the key components is fulvic acid, which plays a vital role in promoting overall health and well-being. Fulvic acid is known for its antioxidant properties, helping to protect the body against free radicals and oxidative stress.

Shilajatu contains 85+ minerals in ionic form, including triterpenes, aromatic carboxylic acids as well as vitamins, humic, fulvic acids and very important phytonutrients. 60-80% of the total nutraceutical compound and some of the oligoelements including Selenium of antiaging properties. **Triterpenes** are hydrocarbons i.e, organic compounds found in animals, plants, microorganisms & humas. Most powerful anti-inflammatory, anti-viral and anticancer compound found in nature, used in food & medicines. It is called as "Precursor for steroids" nature's best anti-inflammatory organic compound.

Dibenzo- α -pyrones are metabolites derived from plants, fungi, animal faeces. It acts as antioxidant with anti-inflammatory properties which helps to regulate mitochondrial function thus enables body cells to absorb & breakdown the nutrients in order to get energy. Iron is very important for the production of haemoglobin which transfer oxygen from the lungs to other parts of the body. *Shilajatu* very rich in iron and humic acid. Thus, helps in preventing the iron deficiency & development of chronic fatigue in athletic persons. Intake of *Shilajatu* increased energy level, thus helps in increasing the production of ATP (Adenosene triphosphate), which is the main source of energy in the human body. ATP produced in the mitochondria where food ingested is converted into energy which enhances the immune system, research shows that substantial increase in T-lymphocytes – plays central role in human immune system. Thus, helps to support the sport persons to build their strength.

Humic substances are fulvic acid, humic acid and humins. **Fulvic acid** soluble in water under different pH conditions because of its lower molecular weight i.e, 2. It is well absorbed in intestinal tract and eliminated within hours from the body, having strong antioxidant actions. Fulvic acid acts as carrier molecules and catalyst which removes deep seated toxins from the body. This helps in effectively transfer the nutrients & other essential compounds into deep tissues. Fulvic acid naturally rich in electrolytes & antioxidants, considered as sources of natural probiotics that remain in digestive system. In the *Shilajatu*, this fulvic acid is naturally occurring organic compound having various health promoting properties such as reducing inflammation, boosting immunity & enhance antioxidant activity, and works effectively as tonic for cardiac, gastric & nervous system as well as anti-stress agent.

When we think of elite athletes, one thing they have in common is muscle – muscle size, efficiency, strength & flexibility. Depending on the sport, their muscle will have different adaptations. Study shows that *Shilajatu* upregulates the genes responsible for making collagen. In the *Shilajatu* contains different related proteins relevant to structural and biochemical integrity of the cells in our body which means joints & muscles will be stronger on a cellular level & at functional level. The upregulation in the body by using *Shilajatu* means genes capacity to generate collagen which increased skeletal muscle adaptability, flexibility and repair after exercise.^[17] Study shows that taking *Shilajatu* before exercise increased exercise duration by 13% and also 13% increase in participants ATP levels.^[17] Fulvic acid has the capability of attracting & binding to electrolytes, minerals, vitamins & probiotics. Increases the activity of digestive enzymes which are responsible for breaking down the protein in our diet into usable amino acids. All these helps in improving the performance in athletic persons by building their strength.

***Shilajatu* in different dosage form**

After the *Shodhana* of *Shilajatu*, direct consumption may be challenging. To make it more user-friendly, it can be converted into various dosage forms such as capsules, tablets, or *Leha*. For example, after *Shodhana*, the purified *Shilajatu* can be dried into a powder using a spray or vacuum dryer. This powder can then be filled into capsules for easy consumption. Alternatively, when *Shilajatu* reaches a thick, semisolid consistency after *Shodhana*, it can be shaped into tablets using a tablet-making machine. These dosage forms can be consumed with *Ksheera*, which is especially beneficial for athletes.

CONCLUSION

Sports medicine is a branch of medicine that deals with physical fitness & the treatment & prevention of injury related to sport and exercise. Its function is not only curative and rehabilitative, but also preventative. Ayurveda plays a significant role in preserving the health of athletes, offering a multitude of herbal, herbo-mineral, *Rasayana* remedies and treatments as mentioned in its texts to support the well-being of athletic individuals. This *Shilajatu* plays an important role in improving the health of athletes. न सोऽस्ति येनो भुवि साध्यरूपः शिलाह्वयं यं न जयेत् प्रसह्य । (च.चि.1/3/65). Judicious use of *Shilajatu* can promote good health & best for boosting athletic performance. Extensive research works regarding this has to be conducted in the field of ayurveda. In this article, we tried to review about *Shilajatu* in improving the athletic excellence.

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