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EFFECT OF RAW ALAY MUMMY (SHILAJIT) ON BLOOD COAGULATION PARAMETERS IN DOGS

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Abstract
This study investigated the effect of **raw Alay mummy (Shilajit)** on several blood coagulation parameters in dogs. The substance was administered orally at a dose of **50 mg/kg**, and blood samples were analyzed before and 30 and 60 minutes after administration. Significant prolongation of **clotting time, plasma recalcification time**, and **thrombin time** was observed ($P < 0.01$), along with increased **plasma tolerance to heparin** and **fibrinolytic activity**. A slight decrease in **fibrin concentration** and moderate rise in **P-, U-, and UP ± X-factors** were also noted. These findings indicate that Alay mummy exerts **anticoagulant and fibrinolytic effects,** likely through activation of endogenous anticoagulant mechanisms and enhancement of fibrin degradation. The results suggest potential use of Alay mummy as a **natural regulator of blood coagulation** and in the prevention of thrombotic conditions.
Keywords: Alay mummy; Shilajit; blood coagulation; fibrinolysis; heparin tolerance; thrombin time; dogs; natural anticoagulant

Introduction

raditional medicine (TM) encompasses a vast and diverse repository of empirical knowledge, skills, and healing practices that have evolved and been transmitted across generations within various cultural frameworks. Rooted in long-standing traditions, careful observation, and experiential wisdom, TM serves not only to maintain general health but also to prevent, diagnose, and manage a broad spectrum of physical and psychological disorders (1). Over the past few decades, scientific and clinical interest in TM has markedly increased, stimulating extensive research aimed at isolating, characterizing, and validating the bioactive constituents of medicinal plants and natural products used in traditional therapies. These studies have provided substantial evidence of their pharmacological efficacy and preventive potential, reaffirming the relevance of TM in modern integrative and evidence-based healthcare systems (2).

Traditional medicine includes several well-established regional schools of thought, such as Traditional Persian Medicine (TPM), Traditional Arabic Medicine, Traditional Chinese Medicine (TCM), and Ayurveda, the ancient medical science of India (3). Among the natural substances employed in these systems, Mumijo—also known as *Shilajit* (Hindi), *Silajatu* (Bengali), *Rock Juice* (Tibetan), *Conqueror of Mountains* (Sanskrit), *Hajarul-Musa* (Arabic), *Moomiaii* (Persian), *Myemu* (Russian), and *Mumie* (German)—occupies a distinctive position. This resinous, pale- to dark-brown exudate, often described as “mineral pitch” or “mineral wax,” has been revered for over three millennia for its rejuvenating, restorative, and adaptogenic properties (4).

The origin of Mumijo has been interpreted through three major hypotheses: biological, geological, and bio-mineralogical. The biological model suggests that it forms via the gradual microbial decomposition of plant and animal matter under specific environmental and physicochemical conditions. The geological hypothesis attributes its genesis to long-term

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mineralization processes within mountainous strata, whereas the bio-mineralogical theory integrates both perspectives, proposing that organic precursors interact with mineral matrices to produce the final complex material. Environmental variables such as local vegetation, soil and rock composition, altitude, temperature, and humidity are believed to play critical roles in determining its chemical composition and biological activity (7).

Despite regional differences, Mumijo generally contains 60–80% organic matter and 20–40% inorganic minerals, enriched with trace elements including Fe, Ca, Cu, Zn, Mg, Mn, Mo, and P (8). This complex mixture of organic and mineral constituents likely underpins its broad pharmacological spectrum.

In Persian medical literature, Mumijo has held a place of high esteem for centuries. In the 10th century, Ahvazi's *Kamāl as-Sanā'a* recommended it for conditions such as headaches, hemoptysis, and asthma. Avicenna, in his *Canon of Medicine*, described Mumijo as a potent restorative agent capable of strengthening the brain, enhancing fertility, and alleviating numerous systemic disorders. Later, in the 12th century, Jurjani's *Zakhire Khwārizmshāhi* documented its therapeutic use for inflammation, ulcers, and diseases of the urinary tract and prostate (5).

Traditionally, Mumijo has been administered in various forms and dosages to treat disorders such as urinary dysfunction, jaundice, gallstones, gastrointestinal disturbances, splenic enlargement, epilepsy, allergic and neurological conditions, chronic bronchitis, tuberculosis, eczema, anemia, and diabetes (9). Nonetheless, ensuring its safety and standardization remains a challenge, particularly due to the risk of fungal contamination and the presence of mycotoxins (10).

Both traditional healers and contemporary researchers attribute to Mumijo a wide range of pharmacological actions—including aphrodisiac, antioxidant, anti-inflammatory, and rejuvenating effects. It has been used in musculoskeletal conditions such as arthritis, fractures, and spondylitis, as well as for wound healing, tissue regeneration, and metabolic regulation (7). Modern phytochemical analyses have demonstrated that its biological activity is largely attributable to compounds such as fulvic and humic acids, dibenzo-α-pyrones, and essential trace minerals, which exert potent antioxidant, anti-inflammatory, immunomodulatory, and antimutagenic effects (8).

Experimental findings further indicate that Mumijo can lower blood glucose levels, improve lipid metabolism, stimulate nucleic acid and protein synthesis, enhance mineral transport to bone and muscle tissues, and promote diuresis and natriuresis (4, 11, 12). Taken together, both traditional knowledge and experimental evidence highlight Mumijo as a complex natural substance with multifaceted biological activities and substantial promise as a source of novel pharmacologically active compounds for modern drug discovery and development.

Materials and Methods.

The study was carried out on clinically healthy adult dogs (n = 10), both sexes, weighing 10–15 kg kept under standard vivarium conditions with free access to food and water. All experimental procedures were performed according to ethical standards and approved by the institutional animal care committee.

The test substance used was **raw Alay mummy (Shilajit),** a natural mineral-organic resin collected from the Alay mountain region of Uzbekistan. The substance was purified and dissolved in distilled water immediately before administration.

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Each animal received **mummy at a dose of 50 mg/kg** body weight administered orally. Blood samples were taken from the cephalic vein **before administration (baseline),** and then **30 minutes** and **60 minutes** after administration.

Venous blood was collected into test tubes with and without anticoagulant depending on the assay. Plasma was separated by centrifugation at 3000 rpm for 10 minutes.

The following parameters were determined according to standard hematological and coagulation methods:

The obtained data were statistically processed using Student's *t*-test. Results are presented as mean ± standard error (M ± SEM). The differences were considered significant at $P < 0.05$ and highly significant at $P < 0.01$.

Results

Administration of **raw Alay mummy (Shilajit) at a dose of 50 mg/kg** produced marked changes in several coagulation parameters in dogs (Table 1).

A significant (**P < 0.01**) prolongation of the **blood clotting time** was observed 30 minutes after administration — from **420 ± 37 sec** at baseline to **876 ± 66 sec**, and it remained elevated (**843 ± 65 sec**) after 60 minutes.

Similarly, the **plasma recalcification time** increased significantly from **83 ± 5 sec** to **109 ± 7 sec** (P < 0.01).

Indices reflecting the anticoagulant system also changed noticeably. **Plasma tolerance to heparin** rose from **360 ± 42 sec** to **580 ± 22 sec**, and **heparin time** increased from **370 ± 38 sec** to **560 ± 35 sec** (both P < 0.01), indicating an enhancement of the plasma's anticoagulant potential.

The intrinsic coagulation factors (P-, U-, and UP ± X-factors) showed a mild but statistically significant rise. The P-factor increased from **26 ± 0.5** to **28 ± 0.7**, and the U-factor from **21 ± 1.5** to **23 ± 0.5** (P < 0.05). The UP ± X-factor showed a stronger response, rising from **36 ± 2.4** to **43 ± 1.1** (P < 0.01).

Thrombin time — a sensitive indicator of fibrin formation — was also prolonged significantly, from **13 ± 1.1 sec** to **23 ± 2.3 sec** (P < 0.01), while the **thrombotest grade** changed from IV to III, confirming a delay in clot formation.

Interestingly, the **fibrin concentration** decreased slightly from **325 ± 5 mg%** to **275 ± 4 mg%**, though this change was not statistically significant ($P = 0.1$).

The **fibrinolytic activity** of plasma increased markedly, with the euglobulin lysis time shortening from **103 ± 8 min** to **74 ± 7 min** (P < 0.01), suggesting activation of fibrinolysis.

In addition, the **total protein level** in plasma rose modestly after 30 minutes (**8.7 ± 0.5 g%** vs. **8.2 ± 0.4 g%**, P < 0.05), then declined to **7.0 ± 0.8 g%** at 60 minutes, reflecting possible redistribution or utilization of plasma proteins during enhanced enzymatic activity.

Table – Effect of Alay Raw Mummy on Blood Coagulation Parameters in Dogs (Dose 50 mg/kg)

Parameters	Baseline	30 min after administration	60 min after administration	P value (30 min)	P value (60 min)
Blood clotting time (sec)	420 ± 37	876 ± 66	843 ± 65	0.01	0.01

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Parameters	Baseline	30 min after administration	60 min after administration	P value (30 min)	P value (60 min)
Plasma recalcification time (sec)	83 ± 5	109 ± 7	106 ± 6	0.01	0.01
Plasma tolerance to heparin (sec)	360 ± 42	580 ± 22	550 ± 34	0.01	0.01
Heparin time (sec)	370 ± 38	560 ± 35	555 ± 35	0.01	0.01
P-factor	26 ± 0.5	28 ± 0.7	29 ± 1.2	0.05	0.01
U-factor	21 ± 1.5	23 ± 0.5	24 ± 0.5	0.05	0.05
UP±X-factor	36 ± 2.4	41 ± 1.2	43 ± 1.1	0.01	0.01
Thrombin time (sec)	13 ± 1.1	23 ± 2.3	22 ± 2.2	0.01	0.01
Fibrin (mg %)	325 ± 5	275 ± 4	275 ± 4	0.1	0.1
Fibrinolytic activity (min)	103 ± 8	74 ± 7	91 ± 9	0.01	0.01
Total protein (g %)	8.2 ± 0.4	8.7 ± 0.5	7.0 ± 0.8	0.05	0.05

Statistically significant differences ($p < 0.05$) compared with baseline values.

Discussion

Administration of raw Alay mummy (Shilajit) at a dose of 50 mg/kg caused significant changes in the coagulation system of dogs, indicating a shift toward hypocoagulation and increased fibrinolytic activity. The prolongation of blood clotting, recalcification, and thrombin times, along with increased heparin tolerance, suggests activation of the body's natural anticoagulant mechanisms.

A moderate rise in P-, U-, and UP ± X-factors may represent compensatory reactions of procoagulant systems to maintain hemostatic balance. The decrease in fibrin concentration and enhanced fibrinolytic activity confirm that mummy promotes fibrin breakdown and reduces clot formation.

These findings indicate that Alay mummy possesses anticoagulant and fibrinolytic properties, likely linked to its bioactive organic and mineral components. Therefore, it may have potential use as a natural regulator of blood coagulation in conditions associated with increased thrombosis risk.

Conclusion

The study demonstrated that administration of **raw Alay mummy (Shilajit)** at a dose of 50 mg/kg significantly influenced blood coagulation in dogs. The substance prolonged coagulation times, increased heparin tolerance, and enhanced fibrinolytic activity, indicating a shift toward **anticoagulant and profibrinolytic effects**. These results suggest that Alay mummy may serve as a **natural modulator of hemostasis** and could be beneficial in

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preventing conditions associated with hypercoagulation or thrombosis. Further studies are recommended to clarify its mechanisms and potential therapeutic applications.

References

1. Qi Z, Kelley E. The WHO Traditional Medicine Strategy 2014-2023: A perspective. Science. 2014;346:S5-S6.
2. "WHO Traditional Medicine Strategy 2014-2023". World Health Organization Retrieved 2014-04-20. 2013.
3. Shahriari M, Zare F, Nimrouzi M. The Curative Role of Bitumen in Traditional Persian Medicine. Acta Med Hist Adriat. 2018;16(2):283-92.
4. Olivieri MF, Marzari F, Kesel AJ, Bonalume L, Saettini F. Pharmacology and psychiatry at the origins of Greek medicine: The myth of Melampus and the madness of the Proetides. J Hist Neurosci. 2017;26(2):193-215.
5. Shirbeigi L ZA, Naghizadeh A, Alizadeh Vaghasloo M. The Concept of Temperaments in Traditional Persian Medicine. Trad Integr Med. 2017;2(3):143-56.
6. Frolova N, Kiseleva L, Tatiana. Chemical composition of mumijo and methods for determining its authenticity and quality (a review). Pharma Chem J. 1996;30(8):543-7.
7. Agarwal SP, Khanna R, Karmarkar R, Anwer MK, Khar RK. Shilajit: a review. Phytother Res. 2007;21(5):401-5.
8. Verma A, Kumar N, Gupta L, Chaudhary S. Shilajitin Cancer Treatment: Probable Mode of Action. Int J Pharmaceutic Bio Arch. 2016;7(1):12-6.
9. Stohs SJ, Singh K, Das A, Roy S, Sen CK. 12-Energy and Health Benefits of Shilajit. In: Bagchi D, editor. Sustained Energy for Enhanced Human Functions and Activity. Academic Press; 2017. p. 187-204
10. Ghosal S, Lal J, Singh SK, Goel RK, Jaiswal AK, Bhattacharya SK. The need for formulation of Shilajit by its isolated active constituents. Phytother Res. 1991;5(5):211-6
11. Trivedi N, Mazumdar B, Bhatt J, Hemavathi K. Effect of shilajit on blood glucose and lipid profile in alloxaninduced diabetic rats. Indian J Pharmacol. 2004;36(6):373-6.
12. Загрутдинов Ф.Ф., Мамадалиев Ш.И., Болтабоева Д.Ф. Влияние Среднеазиатских Видов Мумиё на диурез и натрий урез у Крыс. Open Herald: Periodical of Methodical Research. Volume 2, Issue 5, May, 2024, 12-14