HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

DOSE- AND TIME-DEPENDENT DIURETIC EFFECTS OF KHAMZAABAD MUMIJO IN DOGS

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doi:https://doi.org/10.5281/zenodo.23418707

Abstract: The present study investigated the diuretic effect of Khamzaabad Mumijo in conscious female dogs. The experiment was designed to evaluate the influence of different intravenous doses of Mumijo on urine output over a 4-hour observation period. Urine samples were collected hourly, with the initial collection serving as the control period. Mumijo was administered intravenously at doses of 1, 5, 10, 25, and 50 mg/kg in 10 mL of 0.9% physiological saline. The results demonstrated a marked increase in urine output following Mumijo administration compared with the vehicle control. The diuretic response generally increased with dose and was most prominent between 2 and 3 hours after administration. The highest urine output was observed with 10 mg/kg at 3 hours (268.0 ± 6.4), while substantial responses were also recorded at 25 and 50 mg/kg. These findings indicate that Khamzaabad Mumijo possesses pronounced diuretic activity following intravenous administration. Further studies are required to clarify the underlying renal mechanisms and establish its optimal dose and safety.

Keywords: Khamzaabad Mumijo; Shilajit; diuresis; diuretic activity; urine output; intravenous administration; renal function; conscious dogs.

Traditional medicine (TM) refers to a body of knowledge, skills, and practices based on theories, beliefs, and experiences characteristic of different cultures and used to maintain health, as well as to prevent, diagnose, improve, or treat physical and mental illnesses (1). Accordingly, various studies of traditional medicine have been conducted, and evidence has demonstrated that certain natural medicinal compounds exert beneficial health effects in a range of diseases (2).

Mumijo is a herbo-mineral exudate with a long history of use in traditional folk medicine. It originates from mountainous regions of India (3, 5), as well as Russia (including regions of the former Soviet Union such as the Urals, Altai, Caucasus, Kazakhstan, Sayan Mountains, Baikal, Uzbekistan, and Tajikistan), and is also found in other countries, including China, Pakistan, Nepal, Afghanistan, and Tibet (6). Mumijo, known by various names such as Shilajit, Silajita, Marathi or Gujarati (in Hindi), Asphalt (in English), Silajatu (in Bengali), Rock Juice (in Tibet), Conqueror of Mountains (in Sanskrit), Hajarul-Musa or Arak-al-jibal (in Arabic), Mumijo or Mumnaei (in Persian), μούμια (in Greek), Muemu (in Russian), Mumie (in German), mineral pitch, Jewish bitumen, mineral wax, and Bragshun, is a natural substance ranging from pale brown to blackish-brown that has been used for more than 3,000 years as a rejuvenating and adaptogenic agent (4).

The origin of Mumijo has been explained by three major theories: biological, geological, and biomineralogical. The geological theory proposes that Mumijo is the result of prolonged geological processes. According to the biological theory, Mumijo is thought to be formed from decomposed plant residues or animal excreta under specific physicochemical conditions. In addition, the biomineralogical concept suggests that this compound results from the interaction or mechanical

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incorporation of a liquid Mumijo precursor with mineral factors. Factors including the geographic region of production, plant species, geological characteristics of rocks and soil, local temperature, humidity, and altitude, among others, influence the composition and therapeutic properties of Mumijo (8, 9). Despite similar physical characteristics in different regions of the world, these factors affect the composition and relative proportions of its constituents. In general, Mumijo consists of organic compounds (60–80%), inorganic compounds (20–40%), and trace elements such as Fe, Ca, Cu, Zn, Mg, Mn, Mo, and P (10).

In the 10th century, Ahwazi, in his book Kamil al-Sana'ah, recommended Mumijo for the treatment of cold-induced headaches, hemoptysis, asthma, and the removal of a dead fetus. Avicenna, the renowned Persian physician of that period, recommended Mumijo in his famous Canon of Medicine as a highly effective remedy for strengthening the brain, enhancing fertility, and treating various other ailments. In the 12th century, the Persian medical book Zakhireh Khwarazmshahi, written by Jorjani, recommended Mumijo for inflammation, ulcers, urinary problems, and prostate disorders (7).

Mumijo has been recommended at various doses for a range of health problems, including genitourinary disorders, jaundice, gallstones, gastrointestinal disorders, splenomegaly, epilepsy, hypersensitivity, nervous disorders, chronic bronchitis, tuberculosis, eczema, anemia, and diabetes (11). However, the presence of fungal contamination, particularly mycotoxins, represents a significant limiting factor for the widespread use of Mumijo in global practice (12).

Traditional medicine practitioners claim that Mumijo is effective against conditions such as loss of sexual desire, kidney stones, bone pain and fractures, osteoarthritis, spondylitis, edema, hemorrhoids, aging, rejuvenation, as an antiseptic, obesity, anorexia, and weight loss (9). Due to the anti-inflammatory, antioxidant, antimutagenic, and immunomodulatory properties of fulvic acid (FA) and humic acid (HA), some evidence suggests that Mumijo may have potential as an agent for cancer prevention (10). In addition, various doses of Mumijo have been shown to reduce blood glucose levels and produce beneficial effects on the lipid profile in rats (13). Mumijo extract also improves nucleic acid synthesis and increases the transport of minerals to muscle and bone tissues (6).

Materials and Methods

The effect of Khamzaabad Mumijo on diuresis was investigated in experiments conducted on dogs. The study was designed to determine the optimal dose of Mumijo when administered by different routes and to evaluate whether the route of administration influenced its diuretic effect. The experimental animals were housed under controlled-temperature conditions and had free access to a standard canine diet and drinking water.

The experiments were performed on conscious female dogs. Prior to the experiments, the ureters were exteriorized through the abdominal wall according to the Pavlov–Tsitovich method (E. B. Berkhii and Yu. I. Ivanov, 1972), allowing quantitative collection of urine samples.

Urine samples were collected at hourly intervals for 5 hours. The first urine collection served as the control period. Immediately after collection of the control urine sample, Mumijo was administered either subcutaneously or intravenously at different doses. For intravenous administration, the preparation was dissolved in 10 mL of 0.9% physiological saline solution. Urine output was subsequently monitored at hourly intervals following administration of the preparation. The experimental data are presented in Table 1.

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Results and Discussion

The results showed that intravenous administration of Khamzaabad Mumijo produced a marked increase in urine output in conscious female dogs, with the response varying according to dose and observation time. In the vehicle control group, urine output remained relatively stable throughout the experimental period, indicating minimal influence of the solvent on diuresis. Administration of Mumijo at 1 mg/kg increased urine output from 73.0 ± 1.7 during the control period to 121.0 ± 2.8 at 1 hour and 140.0 ± 3.1 at 3 hours, followed by a decline at 4 hours. At 5 mg/kg, urine output increased progressively, reaching 209.0 ± 2.3 at 3 hours compared with 51.0 ± 1.1 during the control period. A stronger response was observed with 10 mg/kg, where urine output increased from 62.0 ± 1.6 to a maximum of 268.0 ± 6.4 at 3 hours. The 25 and 50 mg/kg doses also produced substantial increases, with maximum values of 194.0 ± 3.5 and 245.0 ± 8.8, respectively. In most groups, the greatest diuretic response occurred between 2 and 3 hours, followed by a decline at 4 hours, suggesting a transient time-dependent effect. Overall, the findings indicate that Khamzaabad Mumijo possesses pronounced diuretic activity following intravenous administration. The dose-related increase in urine output suggests that Mumijo may influence renal water and electrolyte handling. However, the precise mechanism cannot be determined from urine volume alone. Further studies assessing urinary electrolytes, glomerular filtration, renal blood flow, and tubular function are required to clarify the underlying mechanism.

Table 1. Effect of different intravenous doses of Khamzaabad Mumijo on urine output in conscious female dogs

Dose and route of administration	Control period	1 h after administration	2 h	3 h	4 h
Vehicle, i.v.	43.5 ± 1.0	40.7 ± 1.3	48.2 ± 1.1	46.5 ± 1.0	45.2 ± 0
Mumijo 1 mg/kg, i.v.	73.0 ± 1.7	121.0 ± 2.8	137.0 ± 2.8	140.0 ± 3.1	73.8 ± 2
Mumijo 5 mg/kg, i.v.	51.0 ± 1.1	83.0 ± 1.8	173.0 ± 4.0	209.0 ± 2.3	117.0 ± 1
Mumijo 10 mg/kg, i.v.	62.0 ± 1.6	86.0 ± 2.2	213.0 ± 3.6	268.0 ± 6.4	159.0 ± 3
Mumijo 25 mg/kg, i.v.	12.8 ± 0.6	128.0 ± 3.5	194.0 ± 3.5	186.0 ± 2.3	149.0 ± 2
Mumijo 50 mg/kg, i.v.	26.0 ± 3.0	109.0 ± 4.0	232.0 ± 9.6	245.0 ± 8.8	158.0 ± 7.0

Conclusion

The present study demonstrates that Khamzaabad Mumijo exerts a pronounced diuretic effect following intravenous administration in conscious female dogs. The increase in urine output was generally dose- and time-dependent, with the most prominent response observed within 2–3 hours after administration. The findings suggest that Mumijo may influence renal mechanisms involved in water and electrolyte excretion. Further experimental studies are required to determine the precise renal mechanisms, establish the optimal dose, and evaluate the safety and therapeutic significance of its diuretic activity.

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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. Ghosal S. 2006. Shilajit in Perspective. Narosa Publishing House, New Delhi India.
4. Wilson E, Rajamanickam GV, Dubey GP,et al.2011. Review on shilajit used in traditional Indian medicine.J Ethnopharmacol 136:1–9
5. Schepetkin I, Khebnikov A, Kwon BS. 2002. Medical drugs from humus matter: focus on mumie.Drug Devel Res57: 140–159
6. Shirbeigi L ZA, Naghizadeh A, Alizadeh Vaghasloo M. The Concept of Temperaments in Traditional Persian Medicine. Trad Integr Med. 2017;2(3):143-56.
7. 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.
8. Agarwal SP, Khanna R, Karmarkar R, Anwer MK, Khar RK. Shilajit: a review. Phytother Res. 2007;21(5):401-5.
9. 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.
10. 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
11. 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
12. 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.