Biological activity of the mummy.
Publication 1. Antibacterial action. Overview

L.N. Frolova, T.L. Kiseleva
(Institute of Homeopathy and Naturotherapy of the Federal Scientific Clinical Experimental Center for Traditional Methods of Diagnostics and Treatment of Roszdrav, Moscow)

I. Prerequisites for scientific research of mummy in the USSR

Taking into account the numerous and very contradictory historical information about the miraculous medicinal properties of mummy [25], from the beginning of the 60s of the XX century, complex studies of this complex organo-mineral product began in our country. This process was driven by a number of factors:

1. From the Central Asian republics and India came information about miraculous cases "Curing" hopeless patients. The myth of a panacea has emerged.

2. Handicraft made very expensive "preparations" of the mummy began spread throughout the USSR, bypassing the pharmacy network and official medical institutions.

3. Counterfeit mummies flooded the whole country. They were prepared from condensed pear juice and sea buckthorn oil, ashes of rodent droppings and other substances of organic and mineral origin.

4. In medical institutions, deaths and neglected forms of various diseases caused by long-term self-treatment of patients with "preparations" of mummy. Sometimes people would give their last in order to buy them.

5. In the republics of Central Asia and the Caucasus, a planned study of natural resources for the production of domestic medicines of plant, animal and mineral origin.

6. Numerous amateur expeditions and climbing groups made reconnaissance and mapped the location of the mummy with the aim of further harvesting it.

7. In newspapers and magazines, articles appeared on the "miraculous balm." Everything this led to the fact that not only in the harvesting areas, but also in Moscow, St. on a living organism. Beginning in 1965, special scientific symposia began to be held in the USSR, the only topic of which was the mummy.

The initiator of the 1st Inter-Republican Symposium (October, 1965, Dushanbe) was the Tajik State Medical Institute named after Abu Ali ibn Sina. The symposium summed up the first results of the experimental study of mummy: its chemical composition, physical and physicochemical properties, pharmacological activity, possible methods of chemical and biological standardization [10].

The second symposium - "Shilajit and its therapeutic use" - was held at the initiative of the Pyatigorsk Research Institute of Balneology and Physiotherapy (February 1972, Pyatigorsk). It summed up the results of seven years of work after the 1st Symposium. The topic was mainly related to the mummy of Caucasian origin [11].

The last, 3rd special symposium "Experimental and clinical studies of the Central Asian mummy" (May, 1978, Tashkent) was devoted to the results of the study of the Central Asian mummy in preclinical and clinical practice [38].

Despite the fact that sometimes conflicting data are present in the materials of these symposia, the research methods are not unified, and the objects of study were mummy samples of various degrees of purification from different regions of the country, the published research results are of scientific interest.

We analyzed and summarized these materials, as well as methods and results.

subsequent pharmacological studies published in the open press. This publication is devoted to preclinical (pharmacological) studies of mumiyo on models confirming its antimicrobial effect.

II. The results of the study of antibacterial action

In the literature, we found the results of a large number of experimental studies devoted to the study of the antibacterial activity of mummy preparations from raw materials from various deposits [1, 2, 5, 7, 8, 12, 13-22, 26, 28, 30-36]. When analyzing the published data, it was found that they are very contradictory.

In particular, in a number of works, probably using cell culture, the presence of bactericidal and bacteriostatic action of mummy on various microorganisms was established [7, 8, 22, 26, 28–30, 37]. The most sensitive to it are typhoid (0.08% Shilajit solution) [8], Flexner's dysentery bacteria (0.08% Shilajit solution) [8], staphylococci (0.08% Shilajit solution) [8, 15], pyogenic streptococci [30, 31], proteus [29, 31], penicillin-resistant microorganisms [30, 31] and Bacterium proteus vulgaris (1: 640) [22, 23]. Less sensitive are the dysentery bacteria Sonne (0.16% mummy solution) [8], diphtheria bacilli (0.06% mummy solution) [8] and the enterococcus variant Zymogenes [30, 31]. The most persistent are intestinal and paratyphoid bacilli: the bactericidal effect was not detected even at a concentration of 1.25%, as well as enterococci [32],

There is experimental evidence that the bactericidal effect of Shilajit preparations is manifested at a concentration of 2.5% [8], 5% [15, 22, 23] and 7% (on staphylococci) [34], bacteriostatic - at a concentration of 0, 1%, 1% [35, 36, 59], 2% [18, 19], 5% and 10% [13, 15, 23]. The mechanism of bacteriostatic action of 5% and 10% solutions of mummy is possibly associated with their high osmotic activity (hypertonicity of solutions) [13]. It has also been shown that water and broth solutions of mummy during heat treatment, autoclaving and long-term storage do not lose their antibacterial properties [31].

According to Shakirov A.Sh. (1983), the mummy has a strong bactericidal effect, especially the Zeravshan and Tibetan. Samples from these deposits retard the growth of Staphylococcus aureus, Pseudomonas aeruginosa, intestinal and para-intestinal sticks, Proteus, forming a sterile zone around. Afghan, Osh and Chatkal mummies do not have such an effect [30].

According to other sources [5, 19, 20, 23], on the contrary, it is believed that an aqueous solution of mummy [20], mummy-bragshun [23] or mummy extract from raw materials of the Angudai region of Gorny Altai [5] have a very weak antimicrobial activity, in including against Bacterium proteus vulgaris [23], Bacterium acillus subtilis [23], Dyphteroid [23], Bacterium Friendländeri [23], hemolytic and non-hemolytic staphylococcus (0.5% solution) [20], Pseudomonas aeruginosa (0.5 % solution) [18, 19]. There are experimental data indicating that mummy does not possess any bactericidal at all [3, 13, 20, 21, 24, 33] at a concentration of 1%, 0.1%, 0.01% and 0.001% [13], including for E. coli [24], staphylococci in a 2% solution [34], nor bacteriostatic [13, 19-21, 24, 34] at a concentration of 1%, 0.1%, 0.01% and 0.001% [13], including E. coli [24], staphylococci in 2% solution [34], nor bacteriolytic [34] action. Therefore, the mummy does not protect experimental animals from the development of staphylococcal infection and their death [18-21].

According to D.Sh. Shakirova (1968), a 2% solution of mummy inhibits the ability of strains of microorganisms to produce plasmacoagulase, inhibits hemolytic activity and dermonecrotoxin [34]. It was also found that cultures grown on a medium with mummy do not lose agglutinability within 3 days, do not dissociate into the R-form [13, 17], and do not change cultural and morphological properties [17]. In low concentrations (especially 0.01% solution) [17] mummy with long incubation periods (4 days) activates vital

processes in microbes, maintaining their virulent properties [13, 17].

A number of researchers [3, 18–21, 34] believe that mummy is a biological stimulant, and therefore does not have an antibacterial effect on microorganisms. In addition, it has its own microflora [4, 6, 9]: denitrifying and nitrifying bacteria that decompose fiber; anaerobic and aerobic nitrogen fixers; fungi participating in the enzymatic "creation" of mummy [3, 6, 13], gram-positive spore and non-spore rods [6, 13], cocci [13], enterococci [3], sarcins [3, 13], spore-bearing rods [3] , actinomycetes [6] and saprophytic bacteria [13], which indicates its non-sterility [6, 13] and the content of microorganisms in a state of suspended animation [13]. Bacteria of the genus Proteus, Shigella and Salmonella were not found [13].

W.V. Sidikov et al. (1967) studied the effect of mummy on the titer and dynamics of the formation of immune antibodies in animals during immunization with tetanus toxoid. For this, two samples of mummy were obtained from the Institute of Chemistry of the Academy of Sciences of the Tajik SSR and the Uzbek Institute of Regional Medicine of the Academy of Medical Sciences of the USSR. For immunization of animals, purified and adsorbed tetanus toxoid, series 173-9, issued by the Tashkent Institute of Vaccines and Serums, was used [21].

14 rabbits (10 experimental and 4 control) were immunized with tetanus toxoid three times at intervals of 20 days, 0.5 ml intramuscularly. Experienced rabbits received also intramuscularly twice a week, 0.5 ml of 0.5% mummy solution. Titration was performed in mice.

It was found that repeated administration of a 0.5% solution of mummy does not affect the titer of immune antibodies in the body of animals immunized with tetanus toxoid. The titer and dynamics of the growth of immune antibodies in the body of animals receiving mummy does not differ in any way from those in the body of control animals.

Therefore, mummy is not an antibacterial agent and cannot be used to treat infectious diseases [21]. Conducted by N.M. Shamatov et al. (1978), the so-called dermonecrotic test, on the contrary, testifies to the suppression (or loss) of the necrotic ability of staphylococci and a sharp decrease in their formation of α-toxin under the influence of mummy [35].

The effectiveness of mummy preparations in the treatment of infected wounds was shown in A.Sh. Shakirov [28–30]. Considering that the mummy promotes the early disappearance of the pathogenic microflora of infected wounds and their faster healing (bacteriostatic properties), the author recommends using it topically in the form of lotions with a 3-5% or 10% solution, simultaneously with oral administration (general action) once a day at a dose of 0.1-0.2-0.25-0.32 g [28].

III. The discussion of the results

The results of the information and analytical study on the antibacterial effect of mumiyo were summarized by us in Table 1.

From the data in Table 1, it can be seen, despite the numerous experimental studies carried out to study the effect of mummy on a wide range of microorganisms, it is not possible to objectively evaluate their results due to the presence of very contradictory and even mutually exclusive data.

For example, according to some authors, mummy at a concentration of 0.1% and 1.0% has a pronounced bacteriostatic effect [35, 36, 59]. According to other authors, the preparation of mumiyo in the same concentrations does not have either a bactericidal [13] or bacteriostatic [13] effect on microorganisms. At a concentration of 0.08%, mummy has a strong bactericidal activity against staphylococci [8, 15], and at a concentration of 2.0% does not have a similar effect on them [34].

In our opinion, such contradictions are quite natural and are due to several reasons. First, unified experimental techniques have not been developed. Secondly, the studies were carried out with samples of mummy raw materials from different geographic regions, the possibility of a different origin of raw materials and, as a consequence, differences in its composition and biological activity is not excluded. Thirdly, the objects of research are not always clearly indicated: raw materials, extracts or other dosage forms and their concentration. Fourth, the objects of research were various dosage forms obtained using different technological modes. Fifth, none of the studies used standardized mummy samples.

All of the above indicates the impossibility of identifying reliable general patterns between the concentration and antimicrobial biological activity of mummy from various deposits.

IV. Conclusion

To date, the antibacterial effect of mummy cannot be considered reliable from the point of view of evidence-based medicine.

Table 1

The results of studying the antimicrobial effect of mummy on cell culture (according to data literature)

Название бактерий	Характеристика объекта исследования			Действие (результаты эксперимента)			Библиографическая ссылка
	Название	Месторождение	Концентрация	Бактерицидное	Бактериостатическое	Бактериолитическое	
1	2	3	4	5	6	7	8
Тифозная палочка	-	-	0,08% раствор	++	-	-	8
Паратифозная палочка	-	-	1,25% раствор	-	-	-	
Дизентерийные Зонне	-	-	0,16% раствор	+-	-	-	8
Дизентерийные Флекснера	-	-	0,08% раствор	++	-	-	8
Стафилококк	препарат мумиё	-	7,0% раствор	+	-	-	34
Стафилококк	-	-	0,08% раствор	++	-	-	8, 15
Стафилококк	-	-	2,0% раствор	-	-	-	34
Стафилококк золотистый	мумиё	Зеравшан, Тибет	-	++	-	-	30
Стафилококк золотистый	мумиё	Ошское	-	-	-	-	30
Стафилококк золотистый	мумиё	Чаткальское	-	-	-	-	30
Стафилококк гемолитический	мумиё	-	0,5% раствор	+-	-	-	20
Стафилококк негемолитический	мумиё	-	0,5% раствор	+-	-	-	20
Стрептококк пиогенный	-	-	-	++	-	-	31
Пенициллиноустойчивые	-	-	-	++	-	-	30, 31
Bacterium proteus vulgaris (1:640)	-	-	-	+-	-	-	22, 23
Дифтерийные палочки	-	-	0,06% раствор	+-	-	-	8
Энтерококк Zymogenes	-	-	-	+-	-	-	30, 31
Энтерококк	-	-	-	-	-	-	32

1	2	3	4	5	6	7	8
Синегнойная палочка	мумиё	Чаткальское	-	-	-	-	30
Синегнойная палочка	мумиё	Афганистан	-	-	-	-	30
Синегнойная палочка	мумиё	-	0,5% раствор	+-	-	-	18, 19
Протеи	препарат мумиё	Зеравшан, Тибет	-	++	-	-	30
Протеи	мумиё	Ошское	-	-	-	-	30
Протеи	мумиё	Чаткальское	-	-	-	-	30
Протеи	мумиё	Афганистан	-	-	-	-	30
Протеи	-	-	-	++	-	-	29, 31
-	препарат мумиё	-	2,5% раствор	+	-	-	8
-	препарат мумиё	-	5,0% раствор	+	-	-	15, 22, 23
-	препарат мумиё	-	0,1% раствор	-	+	-	35, 36, 59
-	препарат мумиё	-	1,0% раствор	-	+	-	35, 36, 59
-	препарат мумиё	-	2,0% раствор	-	+	-	18, 19
-	препарат мумиё	-	5,0% раствор	-	+	-	13, 15, 23
-	препарат мумиё	-	10,0% раствор	-	+	-	13, 15, 23
-	водный раствор мумиё	-	-	+-	-	-	20
-	водный раствор мумиё-брагшуна	-	-	+-	-	-	23
-	экстракт мумиё	Горный Алтай, Ангудайский район	-	+-	-	-	5
Bacterium proteus vulgaris, Bacterium acillus subtilis, Dyphteroid, Bacterium Friendländeri	-	-	-	+-	-	-	23
-	-	-	1,0% раствор	-	-	-	13
-	-	-	0,1% раствор	-	-	-	13
-	-	-	0,01% раствор	-	-	-	13
-	-	-	0,001% раствор	-	-	-	13
-	-	-	0,1%, 0,01%, 0,001%, 1,0% растворы	-	-	-	13
-	-	-	-	-	-	-	34

Note. The “-” sign means that in bibliographic sources the correspondingno information available. The “+” sign means that activity has been detected. The “+ -” sign means the presence of weak activity, according to the authors of the publications. The “++” sign means the presence of strong activity, according to the authors of the publications.

Literature

1. Altymyshev A.A. Essay on the mummy. - Frunze: Mektep, 1989 .-- 48 p.

2. Altymyshev A.A. Secrets of the mummy. - M .: AST, 1993 .-- 6 p.

3. Kadyrova Kh.V. Bacteriological study of mummy // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - S. 27–28.

4. Kozlovskaya V.I. Treatment of Caucasian mummy diseases of the peripheral nervous systems // Medicine. - 1968. - No. 6. - P. 99-102.

5. Krasnov E.A., Nikiforov Yu.V., Savelyeva L.M. To the chemical research of mummy // Research of medicinal products of natural and synthetic origin: Mater. interuniversity. scientific. conf. - Tomsk: Tomsk University, 1975 .-- P. 93.

6. Kudlaenko L.N. Microbiological study of the Caucasian mummy // Mumiyo and his therapeutic use: Abstracts. report 18 Feb 1972 - Pyatigorsk, 1972. - S. 31–32.

7. Kuzminova M.L., Karimov V.A., Makhsumov M.N., Khalikov T.R. Antibacterial properties of oriental medicinal product mummy // Tr. Institute / Tashkent Pharmacy. Inst. - 1966 .-- T. IV. - S. 736–738.

8. Kuzminova M.L., Makhsumov M.N., Karimov V.A., Khalikov T.R. Influence of the Eastern drug mummy for microorganisms / I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965 .-- P. 32.

9. Kuseltan I.V., Davidyants S.B., Poroshin K.T. On the issue of biochemical research of mummy // Dokl. AN Taj. SSR. - 1964. - T. 7. - No. 11. - S. 15-17.

10. Materials of the I Inter-Republican Symposium on Experimental Study mummy. - Dushanbe, 1965 .-- 154 p.

11. Shilajit and its medicinal use: Abstracts. report 18 Feb 1972 - Pyatigorsk, 1972 .-- 47 with.

12. Muratova Kh.N. Treatment of purulent wounds mummy-asil in the clinic // Surgery. - 1968. - No. 9. - S. 122-124.

13. Oster N.R., Savitskaya L.A., Shakirov E.A. On the study of antimicrobial activity of the mummy // Experimental and clinical studies of the Central Asian mummy // Mater. symposium. May 30, 1978 - Tashkent: Medicine, 1980. - S. 111-116.

14. Savinykh M.I., Gritsyuk Ya.M., Dmitriev A.N. The substance composition and placement of mumie in Gorny Altai. - Novosibirsk, 1991 .-- 55 p.

15. Savinykh M.I., Kononov O.A. Some characteristics of the Altai mountain mummy // Lithology and minerals. - 1990. - No. 6. - S. 94-104.

16. Savinykh M.I., Chelysheva G.M., Tetenchuk K.P., Blinov A.I. Geography and the relationship of the biological activity of aqueous extracts of Gorno-Altai mummy with chemical and pharmaceutical characteristics // Geographic problems of Altai Krai: Abstracts. report to scientific and practical. conf., dedicated. To the 100th anniversary of the Altai Phil. geogr. Islands of the USSR. - Barnaul, 1991. - Part I. - P. 100–103.

17. Savitskaya L.A., Zaitseva T.S., Khusainova S.A. Influence of mummy on growth properties microorganisms // Experimental and clinical studies of the Central Asian mummy: Mater. symposium. May 30, 1978 - Tashkent: Medicine, 1980. - P. 116-118.

18. Sidikov U.V. Antimicrobial action of mummy // Scientific. conf. Tajik honey. in-that them. Abu Ali ibn Sina: Abstracts. report May 26-27, 1964 - Dushanbe, 1964. - pp. 90–91.

19. Sidikov U.V. Antimicrobial effect of mummy in experiments in vitro // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - S. 52–55.

20. Sidikov U. V., Orzuev M.I. Experimental study of antibacterial actions of mummy in staphylococcal infections of animals // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - S. 56–59.

21. Sidikov U. V., Orzuev M. I., Pushkar N. The. Study of the effect of the drug mummy on immunogenesis in animals during immunization with tetanus toxoid // Scientific. conf. Tajik honey. in-ta them. Abu Ali ibn Sina: Mater. conf. - Dushanbe, 1967. - S. 89–90.

22. Syrovezhko N.V. Materials for the pharmacognostic study of Tibetan drug bragshun: Dis. Cand. farm. sciences. - L., 1971. - 165 p.

23. Syrovezhko N.V., Dobromyslov V.V. Antimicrobial action of Tibetan drug bragshun // Pharmacy. - 1971. - No. 3. - P. 85–86.

24. Foigelman A.Ya. Experience of using mummy in the complex treatment of burnt: Abstract of the thesis. dis. Cand. honey. sciences. - Samarkand, 1972 .-- 18 p.

25. Frolova L.N., Kiseleva T.L. The use of mummy in traditional medicine of different countries: a historical excursion // Traditional medicine. - 2007. - No. 2.

26. Khaidarov K.Kh., Ismailova M.B., Mordvintseva O.V. Some information about pharmacological activity of the drug mummy // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - S. 71–72.

27. "Chzhud-i" - a monument of medieval Tibetan culture: Per. with tib. / Preface D.B. Dashieva, S.M. Nikolaev. - Novosibirsk: Science. Sib. Department, 1988 .-- 349 p.

28. Shakirov A.Sh. Mumiyo-Asil in the complex treatment of bone fractures (Experimental and clinical research): Author's abstract. dis. ... Dr. med. sciences. - Tashkent, 1967 .-- 23 p.

29. Shakirov A.Sh. Mumiyo-asil is a powerful remedy. - Tashkent, 1968 .-- 17 p.

30. Shakirov A.Sh. The secret of the ancient balm mummy-asil. 4th ed. - Tashkent: Medicine, 1983 .-- 47 p.

31. Shakirov A.Sh., Kelman Z.N. Effect of mummy-asil on the growth of pathogenic microflora wounds // Med. zhurn. Uzbekistan. - 1965. - No. 8. - P. 58–59.

32. Shakirov D.Sh. Antibacterial properties of the drug mummy // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - pp. 78–79.

33. Shakirov D.Sh. Antimicrobial activity of mummy-asil in relation to some pyogenic microorganisms // Second scientific. conf. young medical scientists of Uzbekistan: Mater. conf. - Tashkent, 1966. - S. 127–128.

34. Shakirov D.Sh. Treatment of purulent wounds mummy-asil (clinical laboratory and experimental research): Author. dis. ... Cand. honey. sciences. - Tashkent, 1968 .-- 22 p.

35. Shamatov N.M., Sharifkhodzhaev A.T., Shakirov A.Sh., Khashimova R.A. The change biological properties of staphylococci under the influence of mummy-asil // Experimental and clinical studies of the Central Asian mummy: Mater. symposium. May 30, 1978 - Tashkent: Medicine, 1980. - S. 119-122.

36. Shamshina T.M., Gershkaron S.I. The experience of using mummy in the treatment of some tissue defects // Actual problems of obstetrics and gynecology. - Tashkent, 1969. - S. 150-151.

37. Sharifkhodzhaev A.T., Shakirov A.Sh., Khashimova R.A., Khudoyarova R.Yu. The study mummy in experimental wound infection // Problems of traumatology and orthopedics. - Tashkent, 1980. - pp. 105–110.

38. Experimental and clinical studies of the Central Asian mummy: Materials symposium on May 30, 1978 - Tashkent: Medicine, 1980. - 124 p.

Frolova, L.N. Biological activity of the mummy. Publication 1. Antibacterial action. Review / L.N. Frolova, T.L. Kiseleva // Traditional medicine. - 2007. - No. 3 (10). - S.46-52.

To favorites