Biological activity of the mummy. Publication 14: Effects on the Central and Autonomic Nervous Systems

L.N. Frolova, T.L. Kiseleva
(Institute of Homeopathy and Naturotherapy NO "Professional Association of Naturotherapists", Moscow)

Biological activity of mummie
Publicatio n 14. Impact on Central and autonomic nervous system
LN Frolova, TL Kiseleva
Institute of Homeopathy and Naturotherapy NO "Professional Association naturotherapeuts" (Moscow)

SUMMARY

An informational and analytical study of the results of numerous experiments to study the effect of mummy on the central and autonomic nervous systems has been carried out.

Key words: mummy, mummy extract, autonomic nervous system, central nervous system, sympathetic receptors, neurotropicaction.

RESUME

Conducted an information-analytical study of the results of numerous experiments on the effect of mummie on the central and autonomic nervous system.

Keywords: mummy, mummy extract, autonomic nervous system, central nervous system, sympathetic receptors, neurotropic action.

The spectrum of biological activity of mummy, described in numerous bibliographic sources, is very diverse [7, 8, 15, 16]. This publication contains the results of experimental studies carried out on various laboratory animals to study the effect of the organo-mineral complex on the functions of the central and peripheral nervous system (NS) in order to substantiate the possible mechanisms of its action.

I. Influence on the autonomic nervous system

The effect of mummy on the elements of the autonomic nervous system was studied by A.I. Leskov et al. (1965) in acute experiments on cats,under medinal anesthesia. The object of the study was a filtered aqueous solution of a dark brown resinous mummy [2].

In the course of studies, it was shown that the introduction of mummy in doses of 200 and 500 mg / kg into the duodenum did not cause (within 1–2 hours of observation) changes in the effects of electric current stimulation of the preganglionic segments of the vagus and sympathetic nerves on the neck. At the indicated doses, mummy also did not change the depressor response to the administration of acetylcholine [2]. Intravenous administration of mummy (10–20 mg / kg) had no effect on the conduction of excitation in the upper cervical ganglion and on the effects caused by acetylcholine. However, the drug 1.5 times increased the depressor response to irritation of the peripheral segment of the vagus on the neck, which indicates some improvement in the conduction of excitation in the ganglia of the cardiac branches of the vagus [2]. The effect of mummy on autonomic NS with intravascular administration was studied by N.A. Shelkovsky withet al. (1965) [17-21].

The results of studies to study the effect of mummy on indicators of peripheral red blood [19] are presented in detail in [10]. In experiments on adult dogs weighing from 10 to 25 kg, changes in the picture of red blood were studied after intravascular administration of mummy extract. Blood for analysis was taken from the femoral vein before the experiment and 5, 30, 60 and 90 minutes after the introduction of the mummy extract, which was injected intraarterially and intravenously in the form of 1-5-10-20-40% solutions of 1 ml / kg body weight animal [19]. In the course of the studies, it was found that the intravascular administration of various doses of mummy extract was accompanied by significant changes in red blood counts, expressed by an increase in the number of erythrocytes, hemoglobin, reticulocytes (specific indicators are presented in [10]). The most pronounced changes were noted after intravenous administration. Thus, intravenous administration of a 5% solution caused an increase in the number of erythrocytes by 13%; 20% - by 19%; 40% leg - by 23% in relation to the original values. With the introduction of a 10% solution of mummy extract, the greatest increase in the number of erythrocytes was observed 60 minutes (by 10.7%) after the administration of the drug [19].

In all studied animals, the initial amount of hemoglobin ranged from 10 to 18 g%. 5 minutes after intra-arterial injection of a 5% solution, the amount of hemoglobin increased sharply - by 21.4%. Subsequently, a decrease in the level of hemoglobin was noted, but by the end of the experiment its value remained 4.5% higher than the initial level. With the introduction of 1% and 40% solutions, the amount of hemoglobin increased and at the end of the experiment, with the introduction of a 1% solution, it increased by 12.4%, and with the introduction of a 40% solution, by 18% [19].

The reticulocyte count in healthy dogs ranged from 0.2 to 3.1%. Immediately after intra-arterial injection of a 1% solution of mummy extract, their number increased by 47%. After 30 minutes, there was a slight decrease, which did not reach the original value. By the end of the experiment, the number of reticulocytes increased again [19]. With the introduction of a 20% solution in the first 30 minutes, there was no change in the number of reticulocytes. Then there was an increase: after 60 minutes - by 50%, and by the end of the experiment - by 66% [19]. With intravenous administration of a 1% solution of mummy extract and intra-arterial 5-10 and 40% solutions, there was a slight wavelike fluctuation in the number of reticulocytes, both upward and downward [19].

The authors believe that changes in red blood are associated with changes in the tone of the autonomic nervous system [10, 19]. In [21]ON. Shelkovsky and N.K. Shelkovskaya (1965) studied the effect of mummy on the platelet composition of the peripheral blood of dogs. Researchconducted with the aim of elucidating the mechanism of action of mummy, since a change in the tone of the autonomic NS is accompanied by changes in the platelet composition of the blood: when the sympathetic section is excited, thrombocytosis is observed, with mental excitement and an increase in the tone of the parasympathetic section of the NS, thrombopenia is observed.

The research results are presented in detail in [11]. Blood for analysis was taken from the femoral vein before the experiment and after 5, 30, 60 and 90 minutes after intra-arterial administration of 40, 20, 10, 5 and 1% solutions and intravenous administration of 1% mummy extract solution. The normal content of platelets in the peripheral blood of healthy dogs ranges from 204 to 576 thousand in mm3 (the average content is 392.0 ± 54.8 thousand) [21]. As a result of the studies, it was found that intra-arterial and intravenous administration of various concentrations of mummy extract caused a drop in the number of platelets in the peripheral blood. The maximum drop was observed within the first 5 minutes after the introduction of all concentrations. The exception is 40% solution, where the maximum fall was observed 30 minutes after injection [21].

With the intravenous administration of a 1% solution of the mummy extract, such a sharp drop in the number of platelets was not observed as with the intra-arterial administration of the extract of the same concentration. This is probably due to different reception in arterial and venous vessels. It was also noted that after intravenous and intra-arterial administration of a 1% extract of mummy, after 90 minutes, the number of platelets approached the initial data [21].

Thus, the authors have shown the effect of mummy on the parasympathetic nervous system, manifested by an increase in its tone [21]. In other works of N.A. Shelkovsky [20] (1965) studied the effect of mummy on blood sugar levels, which change whenthe tone of the autonomic NS: irritation of the parasympathetic section is accompanied by glycogenopenia and hypoglycemia, and an increase in the tone of the sympathetic is accompanied by severe glycogenolysis with hyperglycemia. The studies were carried out on adult dogs weighing 12 to 25 kg. In five series, the drug was administered in the form of 40-20-10-5 and 1% solution intravenously at the rate of 1 ml of solution per 1 kg of animal weight. The sugar content was determined in dynamics 5-30-60-90 minutes after the introduction of the mummy extract in the blood taken from the femoral vein [20]. The research results are presented in detail in [12]. Intra-arterial administration of mummy extract to adult dogs has been shown to cause an increase in

blood sugar levels are directly proportional to the dose of the substance administered. This is probably due to irritation of the sympathetic receptors. Intravenous administration of a 1% solution of the extract caused a gradual decrease in sugar due to an increase in the tone of the parasympathetic part of the nervous system [20].

The pharmacological action of mummy on vegetative NS was studied by V.I. Kozlovskoy (1972) on an isolated (according to the method of F.P. Trinus)small intestine of a rabbit [1]. Sections of the intestine were immersed in turn, first in a glass with Tyrode's solution, then in the test substance: acetylcholine (0.1 mg / ml), histamine (0.2 mg / ml), serotonin and diphenhydramine (0.01 mg / ml), after which were again washed with Tyrode's solution. Then the intestines were immersed in a solution of mumiyo (1 mg / ml), after which the section was washed again and the test substance was reapplied. According to this scheme, 4 series of studies were carried out, 6 experiments in each. The response of an isolated segment to the action of the test substance in the initial state and against the background of the use of mummy was assessed by the number of bowel contractions per minute and its amplitude [1].

It was shown that against the background of the action of acetylcholine, serotonin and diphenhydramine, mummy does not affect the intestines. Against the background of histamine, mummy reduces the contractile activity of the intestines. So, if before using the mummy the number of bowel contractions in 1 minute under the influence of histamine was 3.9 contractions, then after washing the segment and adding the mummy solution, the number of contractions under the influence of histamine was 1.2 per minute. In repeated experiments, an increase in the amplitude of the teeth was noted, which indicates a selective property and some histamine-like effect of mummy [1].

Thus, under the influence of mummy, a weakening of the reaction to the subsequent administration of histamine is noted, indicating a certain sympathomimetic effect on the isolated small intestine. At the same time, mummy does not have a cholinomimetic, serotonin-like and local anesthetic effect [1].

II. Effects on the central nervous system

The data on the effect of mummy on the central nervous system (CNS) are very contradictory.

Research by K.Kh. Khaidarova et al. (1965), indicate that the mummy does not have the ability to selectively act on the nervoustissue (neurotropic action) [13]. Studies by other authors (VD Rogozkin et al. (1965) [9], A. Sh. Shakirov (1965, 1967) [14–16], MN Maksumov et al. (1965) [3]) indicate the ability of the mummy to influence the NS.

A.I. Leskov et al. (1965) studies were carried out on the intravenous effect of mummy on the electrical activity of the brain. Authorsrecorded electroencephalograms (EEG) of rabbits with unipolar and bipolar leads from the frontal, parietal, occipital and associative areas of the cerebral cortex [2].

In the course of the study, it was shown that with the introduction of small doses of mummy, the bioelectric activity of the cerebral cortex did not change significantly. Starting with a dose of 25 mg / kg and, especially, 125 mg / kg, a pronounced restructuring of the oscillatory process towards the prevalence of high-frequency rhythms was noted on the EEG. After 15-60 minutes. after injection, a generalized reaction of activation of sensitive areas of the cerebral cortex occurred. There was a decrease in the threshold of excitability by 1–2 levels of stimulation intensity; the range of rhythm assimilation shifted towards high frequencies, the activation reaction to sound signals increased and lengthened [2].

Studies have shown that mummy in the indicated doses had an exciting effect on the processes of higher nervous activity and the functional ability of nerve cells [2]. Research M.N. Maksumov and V.A. Karimov (1965) it was establishedthe depressing effect of the mummy on the central nervous system, mainly the cerebral cortex. At doses of 50–100 mg / kg, an extension and enhancement of the hypnotic effect of chloral hydrate was observed. The mummy had little effect on the hypnotic effect of barbamil. At doses of 5–10–25 mg / kg, mummy caused a slight desynchronization of the electroencephalogram of the cortex and, to a small extent, of the subcortex [3].

A very extensive research was carried out by Yu.N. Nuraliev (1973-1977) for 700 white mice and 60 rats. The object of the study was the mummy extract obtained from primary contaminated products or their mixture with pure mummy [4–8]. It was found that with a single and multiple administration (at a dose of 50-400 mg / kg), the drug reduced the approximate response 6-10 times [7] and potentiated the effect of hypnotics (especially chloral hydrate) by 1.5-4 times [7, 8]. In the first hours after the introduction of mummy (50–500 mg / kg), the summation capacity of the brain decreased. With prolonged administration of the drug, the summation capacity of the central nervous system increased [7].

There is evidence that mummy is capable of inhibiting the orienting reaction and potentiating the effect of hypnotics. In this regard, studies on the study of the effect of the drug on the effects of tremorogenic agents (corazole and strychnine) are very interesting. In the course of studies, it was found that shilajit in doses of 50-200 mg / kg enhances the convulsive effect and increases deaths from the introduction of minimal toxic doses of corazole and strychnine [7, 8].

According to Yu.N. Nuraliev, the combination of two opposite properties in mummy - potentiation of the effect of hypnotics and tremorogenic drugs, is associated with the complex composition of the organo-mineral complex, each component of which can cause completely different physiological effects [7, 8]. If we take into account the predominantly potentiating effect of mummy on the action of chloral hydrate, then it can be assumed that the calming effect of mummy is associated with its effect on the cerebral cortex.

On the other hand, the enhancement of the effects of corazole and strychnine, the point of application of which are the structures of the limbic system and the spinal cord, is associated with excitation of these structures of the brain and spinal cord under the influence of mummy, which causes an increase in the summative capacity of the central nervous system. Thus, long-term administration of mummy enhances the summation capacity of the central nervous system and sharply reduces the summation-threshold indicators, which indicates an increase in the functional activity of individual centers of the central nervous system [7, 8].

In order to clarify the possible mechanism of action of the mummy Yu.N. Nuraliev also studied the effect of mummy on synaptic biochemical systems. It was found that mummy at doses of 20-200 mg / kg did not possess cholinotropic properties, since it did not change the nature of the action of arecoline, nicotine, acetylcholine [7]. At doses of 20-200 mg / kg, it enhanced the pressor effect of adrenaline [7, 8], administered at a threshold dose of 30 mg / kg. With the introduction of adrenaline (2.5 mg / kg - subcutaneously) and minimal toxic doses of phenamine (5, 10, 15 mg / kg - intraperitoneal) to animals, the drug reduced deaths and hypothermia from the introduction of reserpine (50-100 mg / kg orally) and chlorpromazine in toxic doses (100 mg / kg subcutaneously) [7, 8].

Shilajit in the indicated doses significantly increased stereotypes and prevented hypothermia that occurs upon administration of apomorphine (20 mg / kg), the mechanism of action of which is associated with metabolic disorders and a decrease in the level of catecholamines [7].

Shilajit significantly reduced tryptophan stereotypy, the pathogenesis of which is associated with the formation and accumulation of serotonin in the brain [7]. The drug in dilutions 1: 1000 - 1: 20000 partially or completely removed and prevented the spastic effect of serotonin [7, 8]. The antiserotonin effect of mummy is associated with the content of lithium in it. Shilajit in dilutions of 1: 500 and 1: 2000 removed the spastic effect of histamine, and at doses (50-200 mg / kg) protected animals by 40-100% from lethal doses of histamine [4, 7, 8]. Thus, in the mechanism of action of mummy, an important place is occupied by its adrenopositive and antiserotonin properties [4, 7, 8].

Since the effect of mummy on the central nervous system is mosaic in nature (suppression of the cortex and excitation of the structures of the diencephalon, midbrain and interneurons of the spinal cord), it can be assumed that the latter is due to the interference of mummy in the functional activity of the serotonin and adrenergic systems, most likely due to changes in the exchange of serotonin and norepinephrine [7, 8].

III. The discussion of the results

The results of the information and analytical research carried out were summarized by us in Table 1 (see at the end of the article).

On the basis of experimental studies, it was shown that Shilajit preparations have a mosaic effect on the central nervous system (inhibition of the cortex and excitation of the structures of the diencephalon, midbrain and interneurons of the spinal cord), due to interference with the functional activity of the serotonin and adrenergic systems due to changes in the exchange of serotonin and norepinephrine. Shilajit preparations potentiate the effects of hypnotics and tremorogenic drugs, which is probably due to the complex chemical composition of the organo-mineral complex, which causes an increase in the summative capacity of the central nervous system.

IV. Conclusion

Based on numerous experimental studies, mummy preparations can be considered promising drugs that have an effect on the central and autonomic nervous systems. However, in order to introduce mummy preparations into clinical practice, it is necessary to conduct experimental and clinical studies on standardized samples of dry mummy extract for all of the listed indications. In this case, special attention should be paid to the scientifically grounded selection of doses of dry mummy extract in each case.

Literature

1. Kozlovskaya V.I., Kryshen P.F., Kanishchev P.A. On a pharmacological study of the effect of mummy on peripheral nervous structures and smooth muscles, on the isolated heart of the frog and the vascular system // Mumiyo and its therapeutic application: Abstracts. report 18 Feb 1972 - Pyatigorsk, 1972. - P. 25–27.

2. Leskov A.I., Selavri T.V., Gladkikh A.S. and other Pharmacological study of mummy // I Inter-republican symposium on experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - pp. 33–36.

3. Maksumov M.N., Karimov V.A. Pharmacological characteristics of the oriental drug mummy // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965 .-- P. 37.

4. Nuraliev Yu.N. Antihistamine properties of dry extract of mummy // Scientific. conf. Tajik State Medical Institute: Mater. conf. - Dushanbe, 1969. - S. 85–86.

5. Nuraliev Yu.N. On the adrenopositive properties of mummy // Questions of physiology and morphology of humans and animals. - Semipalatinsk, 1971. - S. 38–39.

6. Nuraliev Yu.N. Influence of mummy on some serotonergic processes // Application of biogenic stimulants in veterinary medicine and animal husbandry. - Odessa, 1972 .-- S. 112.

7. Nuraliev Yu.N. Pharmacology of Shilajit: Author's abstract. dis. ... Dr. med. sciences. - Yaroslavl, 1973 .-- 34 p.

8. Nuraliev Y., Denisenko P. Mumiyo and its medicinal properties. 2nd ed. - Dushanbe: Irfon, 1977 .-- 112 p.

9. Rogozkin V.D., Tukhtaev T. Therapeutic use of mummy in acute radiation sickness in dogs // I Inter-republican symposium on experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - S. 40–42.

10. Frolova L.N., Kiseleva T.L. Biological activity of the mummy. Publication 10. Influence on the growth of tumor cells and some indicators blood // Traditional medicine. - 2009. - No. 4 (19). - S. 34.

11. Frolova L.N., Kiseleva T.L. Biological activity of the mummy. Publication 11. Effects on blood clotting and platelet count // Traditional medicine. - 2010. - No. 1 (20). - S. 34.

12. Frolova L.N., Kiseleva T.L. Biological activity of the mummy. Publication 12. Influence on some biochemical parameters of blood: content of protein fractions and mineral metabolism // Traditional medicine. - 2010. - No. 2 (21). - S. 35.

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

14. 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.

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

16. Shakirov A.Sh., Madzhidov N.M. Shilajit is a stimulant of regenerative processes. - Tashkent: Fan, 1980 .-- 120 p.

17. Shelkovsky N.A., Savenko V.A. To the question of dosage of mummy in experiments on rabbits // I Inter-republican symposium on experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - pp. 103–112.

18. Shelkovsky N.A., Savenko V.A. On the survival rate in sealed chambers of animals that received mummy // I Inter-Republican Symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - pp. 113–119.

19. Shelkovsky N.A., Shelkovskaya N.K., Crane E.M. Picture of red blood with intravascular injection of mummy extract // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - pp. 147–151.

20. Shelkovsky N.A., Shelkovskaya N.K., Andreeva O.I. Sugar content in peripheral blood with intravascular administration of mummy // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - S. 139-141.

21. Shelkovsky N.A., Shelkovskaya N.K. Changes in the platelet composition of blood with intravascular administration of various concentrations extract of mummy // I Inter-republican symposium on the experimental study of mummy: Mater. symposium. - Dushanbe, 1965. - P. 136-138.

Author's address
Ph.D. Frolova L.N.
Institute of Homeopathy and Naturotherapy NO "PANT"
fln1966@yandex.ru

Table 1

Results of studying the effect of mummy on the autonomic and central nervous system

№ п/п	Автор исследования, библиографическая ссылка	Год	Характеристика объекта исследования				Результаты исследований
			Название препарата и его концентрация	Способ и дозы введения	Опытные животные или объект исследования	Место отбора проб мумиё	
I. Влияние на вегетативную нервную систему							
1.	А.И. Лесков с соавт. [2]	1965	водный раствор экстракта мумиё густого	200 и 500 мг/кг – двенадцатиперстная кишка 10–20 мг/кг	кошки	не указано	Не вызывает изменения эффектов раздражения электрическим током преганглионарных отрезков блуждающего и симпатического нервов на шее; не изменяет депрессорную реакцию на введение ацетилхолина. Не оказывает влияния на проведение возбуждения в верхнем шейном ганглии и на эффекты, вызываемые ацетилхолином. В 1,5 раза увеличивает депрессорную реакцию на раздражение периферического отрезка вагуса на шее, что свидетельствует о некотором улучшении проведения возбуждения в ганглиях сердечных ветвей вагуса.
2.	Шелковский Н.А., Шелковская Н.К., Кран Э.М. [19]	1965	экстракт мумиё	внутриартериально и внутривенно в виде 1-5-10-20-40 %-ных растворов по 1 мл/кг	взрослые собаки	не указано	Увеличивает количество эритроцитов, гемоглобина и ретикулоцитов, что связано с изменением тонуса вегетативной НС.
3.	Н.А. Шелковский и Н.К. Шелковская [21]	1965	экстракт мумиё	внутриартериально 40, 20, 10, 5 и 1 % растворы и внутривенно 1 % раствора	взрослые собаки	не указано	Влияет на парасимпатическую НС, что проявляется повышением её тонуса.
4.	Шелковский Н.А., Шелковская Н.К., Андреева О.И. [20]	1965	экстракт мумиё	внутриартериально 40, 20, 10, 5 и 1 % растворы и внутривенно 1 % раствора	взрослые собаки	не указано	Внутриартериальное введение вызывает повышение уровня сахара в крови прямо пропорциональное дозе вводимого вещества. Это связано с раздражением симпатических рецепторов. Внутривенное введение 1 %-ного раствора вызывает постепенное снижение сахара, вследствие повышения тонуса парасимпатического отдела НС.
5.	Козловская В.И., Крышень П.Ф., Каницев П.А.	1972	раствор мумиё		изолированный тонкий кишечник кролика	не указано	На фоне действия ацетилхолина, серотонина и димедрола не оказывает влияния на кишечник. На фоне гистамина уменьшает сокращение кишечника. Ослабляет реакцию на последующее введение гистамина, что свидетельствует о некотором симпатомиметическом действии препарата на изолированный тонкий кишечник. Не обладает холиномиметическим, серотониноподобным и местноанестезирующим действием.

№ п/п	Автор исследования, библиографическая ссылка	Год	Характеристика объекта исследования				Результаты исследований
			Название препарата и его концентрация	Способ и дозы введения	Опытные животные или объект исследования	Место отбора проб мумиё	
II. Влияние на центральную нервную систему							
6.	К.Х. Хайдаров с соавт. [13]	1965	мумиё	не указано	не указано	не указано	Не обладает нейротропным действием, то есть не обладает способностью избирательно действовать на нервную ткань.
7.	А.И. Лесков с соавт. [2]	1965	мумиё	25–125 ммг/кг	кролики	не указано	Оказывает возбуждающее влияние на процессы высшей нервной деятельности и функциональную способность нервных клеток
8.	М.Н. Максумов и В.А. Каримов [3]	1965	мумиё	5–10–25 мг/кг и 50–100 мг/кг	не указано	не указано	В дозах 50–100 мг/кг удлиняет и усиливает снотворный эффект хлоралгидрата. На снотворный эффект барбамила действует слабо. В дозах 5-10–5 мг/кг вызывает небольшую десинхронизацию электроэнцефалограммы коры и в небольшой степени – подкорки.
9.	Ю.Н. Нуралиев [4-8]	1969–1977	экстракт мумиё	50–400 мг/кг	белые мыши (700) и крысы (60)	Средняя Азия	Однократное и многократное введение в 6–10 раз уменьшает ориентировочную реакцию и в 1,5–4 раза потенцирует действие снотворных (особенно хлоралгидрата).
				50–500 мг/кг	то же	то же	В первые часы после введения суммационная способность мозга понижается. При длительном введении суммационная способность ЦНС усиливается.
				50–200 мг/кг	то же	то же	Усиливает судорожное действие и увеличивает смертельные исходы от введения минимальных токсических доз кораэола и стрихнина.
				20–200 мг/кг	то же	то же	Не обладает холинотропными свойствами, так как не изменяет характер действия ареколина, никотина, ацетилхолина; усиливает прессорный эффект адреналина, введённого в пороговой дозе – 30 мг/кг. При введении животным адреналина (2,5 мг/кг подкожно) и минимально-токсических доз фенамина (5, 10, 15 мг/кг – внутрибрюшинно) уменьшает смертельные исходы и гипотермию от введения резерпина (50–100 мг/кг внутрь) и аминазина в токсических дозах (100 мг/кг подкожно). Усиливает стереотипии и предотвращает гипотермию, возникающую при введении апоморфина (20 мг/кг). Уменьшает триптофановую стереотипию.
				разведения 1:1000–1:20000	то же	то же	Частично или полностью снимает и предотвращает спастический эффект серотонина.
				разведения 1:500 и 1:2000	то же	то же	Снимает спастическое действие гистамина.
				50–200 мг/кг	то же	то же	Защищает животных (на 40–100 %) от летальных доз гистамина.

Frolova, L.N. Biological activity of the mummy. Publication 14: Influence on the central and autonomic nervous systems / L.N. Frolova, T.L. Kiseleva // Traditional medicine. - 2010. - No. 4 (23). - P.34-40.