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Balm "Graal" – perspective antinarcotic and antialcoholic remedy

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ABSTRACT

The balm "Graal" (BG) was created within the limits of transnational program "Chernobil Help". It includes the water-spirit secretion pressed out from the feed-curative plants of Caucasus as well as mountain honey, pollen of the Georgian beer flower and the red wine made from the vine of unique bread. The balm is registrated in the Republics of Ukraine and Byelorussia as a radioprotective Means for preventive inspection and medical treatment of radial injuri. The results was of the balm research on antinarcotic and antialcoholic action is represented in the Article, which was held in the medical centre of radiology in Obninsky city of Russian Federation. In experiments on adult mice and rats it is shown, that radioprotective balm "Graal" (the nonalcoholic concentrate) is effective means for preventive maintenance and treatment of various forms of medicinal dependence (alkoholism, a narcotism). In various tests of conditioned reflexive training, it has been shown, that BG considerably reduces amnestic and narcotic action of ethanol. Natural BG (spirit-including) caused considerably smaller changes in behaviour of animals, rather than equivalent volume of the pure spirit contained in balm. Regular introduction BG by an animal improved the general physical condition of animals and raised their serviceability without effects of an exhaustion, characteristics for other neurostimulators.

Keywords: Antinarcotic Effect; Mice; Rats; A Composition of Balm; A Doze

1. INTRODUCTION

Balm "Graal" (BG) contains extracts of a gold root, a ginseng, eleuterococc, beer flower pollen, and other components [1-4] possessing various kinds of biological activity, basic of which are neurostimulatoring and neuromatonizing action, activation of mental processes, increase of physical serviceability, normalization of digestive functions and adaptive action shown in increase of stability of an organism to action of adverse factors of environment.

The literary data, experience of national medicine and results of experimental studying of pharmacological activity of basic components BG testify, that phytopreparation on action of ethanol can possess expressed protective properties in relation to various displays toxic. On the basis of the specified preconditions balm "Graal" has been tested in experiments for animals as the potential means weakening neurodeprimitive effects and toxic later action of alcohol [5-7].

2. MATERIALS AND METHODS

Experiments are carried out on linear mice (CBA × C57 BD) And both a floor, weight 20-25 g and rats Wistar both a floor, weight of 160-230 g. For experiments selected the healthy animals is corresponding to age standards (2, 5-3 months) who contained in conditions vivarium on a standard vitaminized diet (a grain, briquettes, cod-liver oil, cooked cereals).

Balm as a nonalcoholic concentrate entered an animal into a stomach with the help of a needle - probe or as the solutions diluted with distilled water on 0,1 ml/10 g weights of a body of mice and 0,1-0,2 ml/100 g weights of a body of rats. Control animals in all experiments instead of a preparation received water in the same volume.

Antialcoholic effects BG studied on models ethanol intoxications; it was studied to influence nonalcoholic concentrates of a preparation on neorodepressive, amnestic and hipokinetic action of ethanol. Test methods are described at a statement of results.

3. RESULTS AND THEIR DISCUSSION

The standard test for an estimation of a functional tone

of the central nervous system, as it is known, is studying sensitivity of animals to narcotic agents with various selectivity of action on central and forward departments of a brain. Ethanol concerns to neorodeprimitive agents with primary oppressing action on a forward brain. Stimulating components of balm - a ginseng, a gold root, eleuterococc, an extract anther-also possess tonic or stimulating type of action mainly on a bark.

Experiments on mice were carried out in conditions of thermal comfort. Concentrate BG was entered into a stomach in dozes 1, with 3 and 10 ml/kg, counting upon initial BG. For 1 h before introduction of a narcotic doze of ethanol (0,1 ml of 40 % of spirit on 10 g weights of a body (Abdominal cavity). To control mice for 1 h up to ethanol, instead of a preparation intragastric entered water. In a separate series of experiments, for comparison with action of ethanol, tested narcotic effect natural alcoholic BG, containing 40% of ethanol.

Functional tone the Central Nervous System (CNS) estimated on duration of loss after ethanol orthostatical reflex which restoration tested on an output of animals from lateral position.

Results of experiments are submitted in **Tables 1** and **2**.

As the received data (**Table 1**) testify, nonalcoholic concentrate BG possesses steady neuromatonizing effect in a wide interval of dozes - from 1 up to 10 ml/kg that is shown in the fact of durations of level a narcosis. At a part of mice (as a rule, 2-3 of group), received a preparation in dozes of 3-10 ml/kg, loss orthostatical reflex at a narcotic doze of ethanol not seen, that specifies presence expressed by neurostimulating effect BG.

Comparative tests of narcotic effect natural (spirit including) BG and pure 40% ethanol have shown, that vegetative components of balm essentially weaken neurodepremitive action contained in balm ethyl spirit as pure ethanol in the same concentration possesses essentially big narcotic effect, than the same doze of ethanol in structure of balm (**Table 2**). This distinction was precisely shown at rather low dozes BG and ethanol (8 ml/kg). In this case, at 40% of the experimental mice which have received spirit balm, lateral position did not come at all, and duration of a narcosis at other animals of this group averaged 12,8 mines at 24,2 mines in the control.

Influence of nonalcoholic concentrate BG on cognitive functions (training, memory, remembering the learnt skills) at intact and alcoholized animals are investigated in experiences on rats by a method of conditioned reflexes in the shuttle chamber.

For researches the automatic 3-channel shuttle chamber controlled by the microprocessor is used. Programs of development of a conditioned reflex of avoiding (CR-A) were realized automatically with accuracy of sequence of signals and registration of the reaction equal 0,1 сек. Unitary testing included 50 combinations conditionnal (light + a sound - 4 s) and unconditional (impact by a current - 8 s) irvitatings with recurrence of cycles through 32 s. The full cycle of test proceeded about 30 mines during which the level of study at re-testing comes nearer to 90-100%.

Condition cognitive functions estimated on the following basic parameters of speed and productivity of training: to the latent period of a conditioned reflex, AB - 50 - to the number of combinations necessary for achievement of a level of 50% study, regress of the attitude

Table 1. Antinarcotic effect of nonalcoholic concentrate BG in ethanol test for mice.

Groups	A doze, ml/kg	Number of mice	Duration of a narcosis of mines, M ± m	Number of mice without lateral position
1	The control	10	37,7 ± 4,8	0/10
2	0,3	10	26,2 ± 2,2	0/10
3	1,0	10	16,3 ± 3,0*	1/10
4	3,0	10	15,5 ± 2,7*	3/10
5	10,0	10	19,6 ± 1.2*	2/10

*-Authentic distinction with the control ($P < 0.05$).

Table 2. Comparative narcotic action of natural balm and ethanol at equal concentration and dozes of ethyl spirit.

Groups	A doze, ml/kg	Number of mice	Duration of a narcosis of mines, M ± m	Number of mice without lateral position
Ethanol 40%	10	10	36,4 ± 4,1	0/10
Balm	10	10	22,0 ± 3,4*	0/10
Ethanol 40%	8	10	24,2 + 2,6	1/10
Balm	8	10	12,811,5*	5/10*

*-authentic distinction with pure ethanol in the same doze ($P < 0.05$).

of number of successful reflexes (avoiding of impact by a current) to unsuccessful passing of impact) at the step-by-step analysis of results of activity, with an interval in 2 attempts.

Reliability of distinctions with the control estimated, using parametrical and nonparametric methods of the statistical analysis (software package Statgrafics).

2 series of experiments in which estimated influence of concentrate BG on cognitivefunctions at unitary and repeated introduction of a preparation are lead. Antialcoholic action BG estimated on rats with a steady conditioned reflex, at introduction of ethanol in a narcotic doze 1 day prior to carrying out the test in the shuttle chamber.

The party of preliminary selected rats – mal-rats (40 individuals), has been divided into 4 groups on 10 animals whom entered BG in dozes 1, 3 and 10 ml/kg or water, for 1 hour before test in the shuttle chamber. Tests carried out in first half of day, in parallel in 3 chambers, at randomized sequences of testing of animals from different groups. Similar tests with introduction of a preparation in the same dozes have been lead repeatedly in 1 day and for 4-th day after the first test.

The results submitted in **Table 3**, testify, that BG in dozes of 3 and 10 ml/kg in 1,5-2 times are raised with speed of development of a conditioned reflex in the first cycle of training (the factor of regress b grows); in the subsequent tests, purpose of a preparation in all tested dozes provides more successful fastening and reproduction CRA. Apparently from the **Table 3**, BG raises speed of reaction of animals on conditional stimulus.

Further we estimated influence of repeated introduction BG on training and preservation of skills. Experiences are lead on 2 groups of rats (n = 10, in everyone), which within 5 days before tests in a stomach entered BG (3 ml/kg, experience) or water (control). Ability to training tested for 6 day, and the level of consolidation and reproduction of a reflex estimated in 3 and 6 day after the first test, not stopping thus of daily introductions BG. Directly after carrying out of the final test to rats of both groups intragestic entered ethanol (3 г/kg) and the next day carried out repeated testing CRA (**Table 4**).

From **Table 4** it is visible that concentrate BG, at 5-day's introduction, provides higher speed of development of a conditioned reflex, than in the control, and promotes more effective fastening and reproduction of the produced skill. Introduction of alcohol on a background of the produced conditioned reflex results at control rats to expressed amnestic effect the next day after alcoholization. Purpose BG before alcoholization renders essential antiamnestic effect, providing preservation of the produced reflex at a level achieved at previous testing.

Results give the basis to conclude, that nonalcoholic basis BG at purpose inside in dozes of 1-10 ml/kg, renders positive influence on cognitive processes at rats. BG weakens the neurotoxic effects of alcohol shown in infringement of processes of reproduction of conditioned reflexes after alcoholization.

One of the most universal elements of behaviour of animals is research reaction which is peculiar all healthy animals placed in new conditions. Such activity is used as extremely informative parameter for an estimation of force and stability of motivational excitation CNS, and also characteristics of an emotional condition of animals.

Table 3. Influence БГ on development, preservation and reproduction CRA at rats at introduction of a preparation before testing (1 day of experience).

Dozes, ml/kg	Latent period CRA, s	AB-50	Factor of regress, S/NS	
			a	b
The control	25,80 ± 0,69	45,8 ± 11,3	0,13 ± 0,08	0,09 ± 0,01
1	24,8 ± 0,68	41.9 ± 9,2	0,04 ± 0,07	0,12 ± 0,01
3	24,4 ± 0,88	39,7 ± 9,6	0,03 ± 0,03	0,15 ± 0,01*
10	24,2 ± 0,74	35,3 ± 8,2	0,68 ± 0,38	0,18 ± 0,04*
The control	26,5 ± 3	28,4 ± 4,2	0,74 ± 0,21	0,10 ± 0,01
1	23,8 ± 0,59*	18,5 ± 9,3	0,10 ± 0,17	0,15 ± 0,01*
3	25,6 ± 0,60	16,1 ± 4,1	0,32 ± 0,18	0,18 ± 0,01*
10	24,4 ± 0,56*	3,5 ± 4,5*	1,21 ± 0,13	0,21 ± 0,02*
The control	26,3 ± 0.43	23,0 ± 7.7	0.61 ± 0,11	0,13 ± 0,02
1	23,1 ± 0,49*°	14,9 ± 7,6	0,57 ± 0,12	0,19 ± 0,01*
3	25,3 ± 0,47°	10,2 ± 2,8	0,09 ± 0,26	0,29 ± 0,03*
10	24,7 ± 0,47*	3,0 ± 1,8*	0,13 ± 0,38	0,32 ± 0,04*

AB - 50 - quantity of consecutive cycles of the testing necessary for achievement of a level of 50% study; S/NS-step-by-step regress of the attitude success/non-success, where and a free member, b - the factor of regress describing speed of training. Badges mark authentic distinctions with the control over t-test Student (*) or median to criterion the Manna-Witny (o).

Influence of nonalcoholic concentrate BG on psychomotor behaviour of animals is investigated in experiences on the mice placed in an open field actometre Opto-Varimex. Locomotive activity and the emotional status of mice estimated on number of crossing of beams of the infra-red sources located on perimeter with an interval of 3 sm (locomotive activity), to quantity of movements on a place (non locomotive activity - quantity of crossings of the same beam), to number lead in hinder legs (vertical activity), to quantity of certificates grooming.

The concentrate is tested in dozes 1, 3 and 10 ml/kg, intragastric. To control mice entered water in the same volume. Research in actometer carried out through 30 mines after introduction BG or waters. The test proceeded 10 mines with registration of parameters of psychomotor behaviour for every mines, under condition of consecutive alternation of animals from different groups. From the moment of introduction BG or waters up to a premise in actometer, contained mice individually in the small cells limiting research activity. Experiences are lead in the afternoon with 10 up to 14 h.

For an estimation of antitoxic action BG at an alcoholic poisoning, one of groups of mice 1 day prior to the test entered ethanol, in a doze of 3 ml/kg. And other group ethanol together with extract BG, in a doze of 10 ml /kg, counting upon a nonalcoholic concentrate. Next day to mice of the specified groups, for 30 mines up to actometric test, intragastric allowed water (**Table 5**).

It is established, that nonalcoholic BG renders distinct neurostimulatory action - at mice parameters of research activity in an open field have undergone changes: in dozes of 3 and 10 ml/kg the concentrate raises total length of run of animals, vertical activity and number of jogs. Non-locomotive the activity reflecting stereotyped reactions, characteristic for conditions of hyperexcitation intragastric complex (for example, at excitation phenamin, apomorfene and other neurostimulators), at introduction of a concentrate essentially does not change. It is not revealed also essential influence of a concentrate on emotionally - fob reactions of animals which are reflected in grooming.

At introduction of a narcotic doze of ethanol 1 day prior to testing in an open field, at mice the expressed oppression of all parameters of the spontaneous impellent activity, testifying about deferred neurodeprimative action of alcohol was observed. The specified effect can be regarded as display toxic lateraction of the ethanol, comparable with aldehid a syndrome usually developing

Table 4. Influence of repeated preliminary introduction BG (3 ml/kg) on parameters of conditioned-reflexive activity and toxic later action of alcohol at rats.

Day of test	Groups	AB-50	Factor of regress, S/NS	
			a	b
1	Water	98 ±85	0,18 ± 0,03	−0,03 ± 0,03
	Balm	55 ±50	0,15 ± 0,01	0,08 ± 0,01
3	Water	30 ± 10	0,04 ± 0,16	0,13 ± 0,02
	Balm	23 ± 12	−0,18 ± 0,23	0,24 ± 0,02*
6	Water	32 ±7	−0,05 ± 0,12	0,19 ± 0,01
	Balm	15 ± 5	0,16 ± 0,18	0,30 ± 0,01*
7	Water + ethanol	48 ± 10	0,06 ± 0,11	0,12 ± 0,03°
	Balm + ethanol	16 ± 4	0,12 ± 0.09	0,25 ± 0,22*

*-Authentic distinction with water under t-test Student: * - the same. In comparison with the results of the test received before introduction of ethanol.

Table 5. Influence of nonalcoholic BG on parameters of mice behaviour in open field and on toxic lateraction of alcohol.

Groups	Locomotive activity	Non-locomotive activity	Number of jogs	Number of racks	Number of certificates grooming
Water	1720 ± 320	2330 ± 250	121 ± 16*	75 ± 10	6.1 ± 1.6
BG. 1 ml/kg	2150 ± 350	2630 ± 265	142 ± 14*	90 ± 9[n]	5.9 ± 1.3
Bg. 3 ml/kg	2338 ± 370	2240 ±.150	178 ± 15*	113 ± 10*	3.5 ± 1.1
BG, 10 ml/kg	2430 ± 520	2400 ± 330	193 ± 19*	75 ± 11	6,4 ± 1.3
Ethanol, 3 g/kg	650 ± 56*	745 ± 160*	25 ± 6*	11 ± 8*	3.2 ± 0.6*
Ethanol + BG,10 ml/kg	1430 ± 145°	1660 ± 167°	95 ± 12°	63 ± 7°	6.8 ± 1.2°

* - Authentic distinction with the group receiving water (P < 0,05); ° - the same in comparison with group receiving ethanol 1 day prior to the test.

at the person after reception of the big dozes of alcohol. Introduction of extract BG in a doze of 10 ml/kg practically completely eliminated the specified postalcoholic depression and provided preservation of parameters of impellent activity of animals, in day after alcoholization, at a level close to norm.

The received results testify, that the nonalcoholic basis of balm renders moderately expressed stimulating influence on CNS, not causing thus of the phenomena of hyperexcitation and the by-effects peculiar neurostimulators of mobilizing and exhausting action. Extract BG, at the same time, renders the expressed antialcoholic effect, weakening the deferred displays neurotoxic ethanol after heavy alcoholization.

One of biological properties of a gold root, ginseng, and eleuterococc, included in balm, ability to raise physical endurance and serviceability of the person and animals which is especial at regular application of the specified preparations.

For an estimation of these properties of a nonalcoholic concentrate of balm, experiments on mice with use of the tool method allowing versatilly to characterize the physical status of animals are lead.

Experiences are executed on mice both a floor, weight of 20-24 g. For an estimation of serviceability used modified test Kiplinger which essence consists in an estimation of speed of navigation of the trained animals at repeated running a standard distance (1,8 m). For this purpose used installation with automatic registration of time swimming distances and machining of the information. On the basis of mathematical models of hydrodynamics of mice at navigation, with the help of a package of the specialized programs - starting capacity (Nst), volume of work up to 50% of exhaustion (A_{50}), volume of work up to full exhaustion (A_{100}), corresponding to decrease in capacity the following parameters of serviceability expected for 90% and factor of speed of exhaustion (K), expressed by loss of capacity (W) on unit of executed work (J).

The concentrate was entered inside daily within 6 days in dozes 1, with 3 and 10 ml/kg and into day of carrying out of the test, 1 hour prior to swimming test. To control mice entered water in volume of 0,1 ml/10 g. For an estimation of antialcoholic properties BG, one of experimental groups of mice 1 day prior to the test entered ethanol in a narcotic doze (3 ml/kg), and other group - ethanol (3 ml/kg) together with nonalcoholic concentrate BG. In a doze of 10 ml/kg. The next day after alcoholization to mice of both groups 1 hour prior to the swimming test allowed water (0,1 ml/10 g) as the control. Results are submitted in **Table 6** as the relative parameters expressed in % to the control.

As follows from the received data, the concentrate at regular introduction renders essential stimulating influence on physical serviceability of mice, at dozes of 3 and 10 ml/kg. In a doze of 1 ml/kg this action is found out less. Stimulation of serviceability is shown in increase in starting capacity (up to 25%), decrease in factor of exhaustion (on 16-23%) and essential increase in volume of work up to criterion A_{50} (on 34-42%) and criterion A_{100} (on 29-34%).

Introduction of a narcotic doze of ethanol 1 day prior to the swimming test results in development in mice, the next day, expressed hypodynamic condition shown in decrease of all parameters of serviceability. Simultaneous introduction of nonalcoholic extract BG (10 ml/kg) provides expressed protective effect in the attitude specified hypodynamic lateraction of alcohol.

Thus, concentrate BG at regular introduction improves the general physical condition of animals, raises high-speed characteristics of performance of work, volume of work and endurance, in conditions naturally - motivated loadings. Introduction BG simultaneously with ethanol 1 day prior to physical loading weakens oppressing influence of an alcoholic intoxication on serviceability of animals.

Table 6. Influence of nonalcoholic concentrate BG on parameters physical serviceability of mice (in % to the control) and hypodynamic effect of alcoholic intoxication at an estimation in the swimming test for speed.

Preparations	Nst	K	A_{50}	A_{100}
The control (water)	100,0 ± 4,5	100,0 ± 5,3	100,0 ± 5.6	100,0 ± 7,4
BG 1 ml/kg	117,9 ± 7,2	115,3 ± 8,4	112,0 ± 11,9	120,9 ± 16,7
BG 3 ml/kg	125,1 ± 5,8*	84,5 ± 3,8*	129,1 ± 7,3*	134,6 ± 8,3*
BG 10 ml/kg	119,5 ± 4,2*	77,6 ± 5,5*	134,0 ± 9,8*	142,1 ± 9,5*
Ethanol 3 g/kg	60,3 ± 3,4*	135,2 ± 9,2*	55,7 ± 3,5*	64,1 ± 5,9*
BG 10 ml/kg + ethanol 3 g/kg	109 ± 6,3°	103,3 ± 7,6°	113,0 ± 9,3°	110,9 ± 11,6°

Nst - starting capacity, K - factor of exhaustion, A_{50}, A_{100} - volume of work up to 50 % and full exhaustion; * - authentic distinction with the control. ° - the same, in comparison with ethanol. Number of mice in each group = 10.

As a result of the lead researches it is established, that balm "Graal", due to a complex contained in it adaptogene, neurostimulating and tonic components, possesses the expressed antialcoholic properties and weakens consequences of an alcoholic intoxication.

In experimental models it is shown, that the nonalcoholic basis of balm weakens oppressing action of ethanol on CNS levels development of a postalcoholic amnesia, and also reduces neurotoxic and somatic symptoms later action of alcohol, in particular such, as depression of spontaneous impellent activity and decrease in physical endurance of animals which, apparently, are connected to an intoxication acetaldehid guide. The marked effects phytocomplex, are caused, probably, not only physiological antagonism of stimulating components of balm in the attitude neurodeprimative effects of alcohol, but also, are consequence of antitoxic action of chemical components phytocomplex in the attitude of effects acetaldehid.

Antialcoholic properties of extracts from plants of family aral are well-known in national medicine in this connection a ginseng, a gold root, eleuterococce and other plants of this group long since use as additives to alcoholic drinks.

On the basis of the received experimental data and known experience of use of vegetative preparations of family aral in wide medical practice, the medical product "Balm Graal" is recommended to be used in quality reciptive the components, added in a medical doze to alcoholic drinks with the purpose of easing displays of toxic action of ethyl alcohol.

4. SUMMARY

In experiments on mice and rats, it was shown that a composite base (alcohol-free concentrate) of a radio-protective balsam "Graal" (BG) is an effective remedy for prevention and alleviation of drug addiction (e.g. alcoholism).

Alcohol-free concentrate of BG possesses a steady neuro-stimulatory effect and substantially decreases duration of ethanol narcosis. Comparative testing of narcotic effect of a native (alcohol-containing) BG and pure 40% ethanol showed remission of a neuro-depriming impact of alcohol contained in BG. Examination of influence of alcohol-free BG on cognitive functions (learning, retention, and retrieval of the learned tasks) showed improvement of conditioned reflex activity. When applied before alcoholization, BG had a dramatic anti-amnesic effect and decreased neurotoxic effects of alcohol. This substance stimulated the CNS without any hyper-excitation or other side-effects, characteristic of other neuro-stimulants.

Upon its systematic application, balsam Graal improves an overall physical state of animals, increases a work velocity, its volume, and stability against exhaustion under naturally motivated load.

REFERENCES

[1] Melkadze, R.G. (1993) Ingredients composition of "Graal" balsam. Patent # 2018519 (Russian Federation).

[2] Melkadze, R., Kostava, S., Nadiradze, Z. and Dgurkhadze, R. (2003) New curative drink. *Journal of Beer and Beverages* (*in Russian*), **2**, 68.

[3] Melkadze, R.G., Adamia, R.S., Nadiradze, Z.N. and Kostava, S.I. (2004) Effective antistressful means. Crimea (Ukraine), Sudak, 50-51.

[4] Melkadze, R.G. (2005) Curative balms – Drinks of health. Mecniereba, Tbilisi, 134 (in Russian).

[5] Melkadze, R.G. (2003) Alcoholic beverage from tea and its antitoxic properties. *Journal of Beer and Beverages* (*in Russian*), **5**, 54-55.

[6] Melkadze, R.G. and Shalamberidze, M.A. (2006) Counter-radiation balm and its medical properties at Radiation injuries and functional disorders in gastrointestinal tract. *Proceeding of the Georgian Academy of Sciences*, *Biological Series A*, *Tbilisi* (*in Russian*), **32(1)**, 91-96.

[7] Melkadze, R.G. (2008) Antioxidant potential and poliphenolic complex of "Georgian Elixir". *J.* "*Novation*", Kutaisi, **3**, 10-13.

