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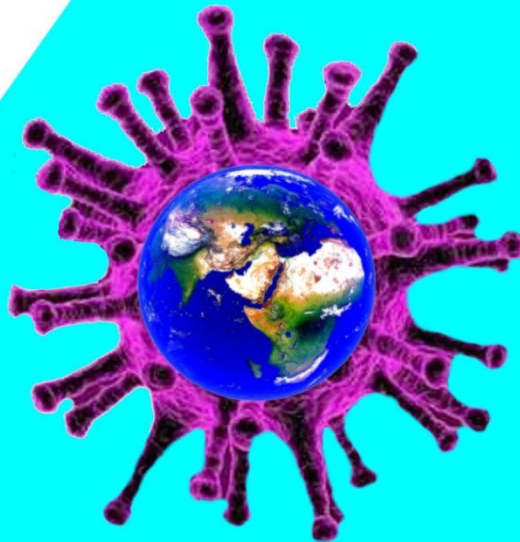
SCIENCE WITHOUT BORDERS

COVID-19: A GLOBAL PROBLEM
FOR MODERN CIVILIZATION

Transactions
of the International Academy of Science
H&E

Volume 5

SPECIAL EDITION
2020



Innsbruck

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**Science Without Borders. COVID-19: A global problem for modern civilization.
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A special edition of the book "Science Without Borders" is dedicated to the most important problem of modern civilization at present - the fight against a pandemic of COVID-19.

The authors of this issue offer their concept of reducing the risks of coronavirus infection and mortality from it before the advent of the vaccine.

Based on the analysis of long-term clinical and laboratory tests of the drug "«AZEOMED»", the authors give convincing arguments in support of the possibility of effective use of the drug "«AZEOMED»" in the process of prevention and treatment of COVID-19.

Clinical and laboratory studies of the mineral composition "«AZEOMED»" were coordinated and funded by the International Scientific and Technical Complex "Intergeo-Tethys". The book contains data on analogues of the drug AZEOMED produced in different countries.

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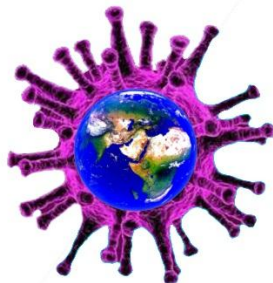
FOREWORD

A special edition of the book “Science Without Borders” is dedicated to the most important problem of modern civilization at present - the fight against a pandemic of COVID-19. The authors of this edition of the book presented the results of an analysis of the development of a pandemic in the world in comparison with the development of the epidemiological situation in China. An attempt has been made to understand the main reasons that in many countries of the world the pandemic situation is developing according to a more pessimistic scenario than in China.

The authors of this issue offer their concept of reducing the risks of coronavirus infection and mortality from it before the advent of the vaccine. The book provides relevant results of 20 years of research on clinical and laboratory tests of the «AZEOMED» mineral complex (mineral food supplement), which was developed as part of the joint scientific program of the Azerbaijan Section of the International Academy of Sciences and the International Scientific and Technical Complex "Intergeo-Tethys".

Based on the analysis of long-term clinical and laboratory tests of the drug «AZEOMED», the authors give convincing arguments in support of the possibility of effective use of the drug «AZEOMED» in the process of prevention and treatment of COVID-19.

COVID-19: A GLOBAL PROBLEM FOR MODERN CIVILIZATION



PROSPECTS FOR APPLICATION OF “«AZEOMED»” MINERAL COMPOSITION FOR PREVENTION AND TREATMENT OF COVID-19 AND OTHER SEVERE ILLNESS

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SUMMARY

The paper discusses the results of 20 years of clinical and laboratory studies of the effectiveness of the mineral composition - food supplement «AZEOMED» based on natural zeolite - clinoptilolite of the Aydag deposit of Azerbaijan. The results of comprehensive studies published in scientific papers and having official conclusions of state medical institutions and scientists of Azerbaijan, Germany, Austria and Russia made it possible to establish the high effectiveness of the drug «AZEOMED» in the prevention and treatment of severe infectious diseases - bird flu H5N1, pulmonary tuberculosis, polio, HIV / AIDS, ARI and other viral and bacterial infections.

Clinical and laboratory studies have established that «AZEOMED» has highly effective immunotropic properties, is an effective detoxifier and antioxidant, and helps to eliminate toxins from the body, including those produced by pathogenic bacteria, viruses and fungi. In addition, the drug has antiviral, antibacterial and antifungal activity and adsorbs many types of viruses and bacteria. The effectiveness of the drug in the prevention and treatment of diseases of the cardiovascular system, hypertension, diabetes and cancer has also been established.

Based on an in-depth analysis of the many years of results of clinical and laboratory studies of the drug «AZEOMED» and its biophysical, biochemical and physiological mechanisms of exposure to the human body and viral and bacterial infections, the authors consider the use of the drug «AZEOMED» for the prevention and treatment of COVID-19 to be promising.

Key words: COVID-19 pandemic, «AZEOMED» mineral complex, coronavirus, viral and bacterial infection, antiviral and antibacterial activity, immunostimulant, detoxicant, antioxidant.

1. COVID-19 PANDEMIC - MODERN CHALLENGES FOR HUMANITY AND POSSIBLE WAYS TO OVERCOME THEM

by Dr. Tamila Khalilova, Azerbaijan

The COVID-19 outbreak began in mid-December 2019 in Wuhan, Central China. Until February 19, 2020, SARS-CoV-2 infected more than 75,000 people in China and 25 more countries on five continents / 1 /.

Coronavirus infection has been known since 1965. Currently, more than forty types of the virus have been described; there are seven examples of overcoming the interspecific barrier between the animal world and humans. The

most striking examples of this overcoming are the Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS), first reported in China in 2002. Its subspecies is today's COVID-19. As for the current situation, the coronavirus COVID-19 behaves as a typical natural focal infection / 1 /.

In the framework of phytoepidemiological approaches, specific directions of virus transmission from person to person and sources for international cases of infection were identified.

The authors / 1 / suggest that SARS-CoV-2 may already have been widely distributed among people in Wuhan until December 2019, probably from mid to late November. Some infected patients may have been overlooked because they had mild symptoms.

According to / 2 /, (as of March 28, 18:20 GTM), the number of people infected worldwide is 645.956 people, the number of deaths is 29.980 (4.6%), the number of people who have recovered 139.552 (21.7%), who were sick at the time of receiving the data 476.424, of which moderate severity is 451.686 (95%), in critical condition 24, 738 (5%).

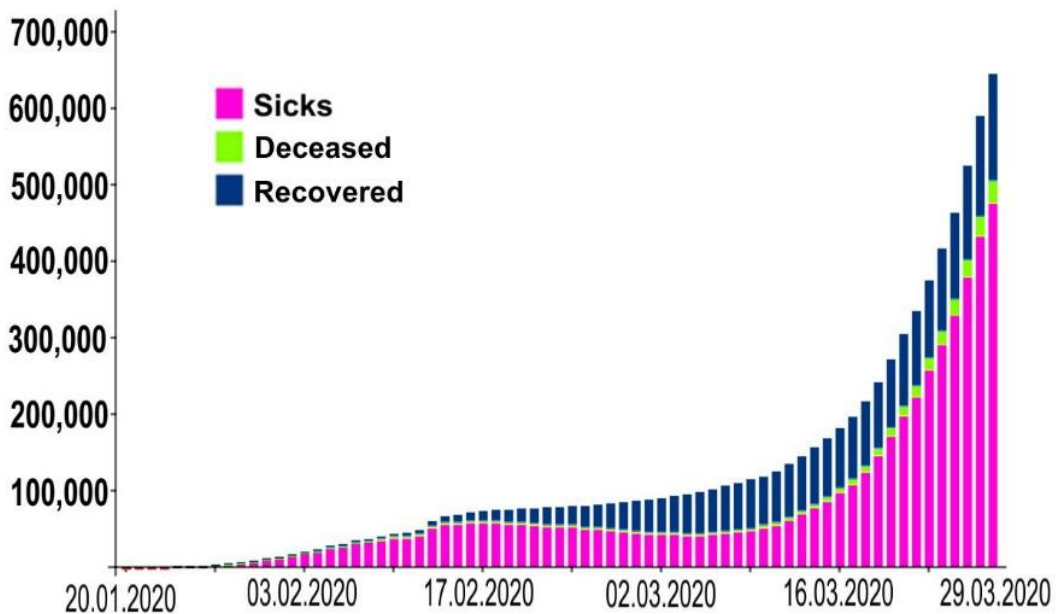


Figure 1: Diagram of the dynamics of patients who died and recovered in World, according to /2/.

Data for the top 10 countries by the number of patients with coronavirus are shown in Table 1. / 2 /.

Table 1.

Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	1 st case
World	645,956	+49,644	29,980	+2,638	139,552	476,424	24,738	82.9	3.8	Jan 10
USA	116,326	+12,200	1,943	+247	3,224	111,159	2,666	351	6	Jan 20
Italy	92,472	+5,974	10,023	+889	12,384	70,065	3,856	1,529	166	Jan 29
China	81,394	+54	3,295	+3	74,971	3,128	886	57	2	Jan 10
Spain	72,248	+6,529	5,812	+674	12,285	54,151	4,165	1,545	124	Jan 30
Germany	56,202	+5,331	403	+52	6,658	49,141	1,581	671	5	Jan 26
Iran	35,408	+3,076	2,517	+139	11,679	21,212	3,206	422	30	Feb 18
France	32,964		1,995		5,700	25,269	3,787	505	31	Jan 23
UK	17,089	+2,546	1,019	+260	135	15,935	163	252	15	Jan 30
Switzerland	13,377	+449	242	+11	1,530	11,605	280	1,546	28	Feb 24
Netherlands	9,762	+1,159	639	+93	3	9,120	761	570	37	Feb 26

The evolutionary history of SARS-CoV-2, studies of the distribution dynamics of COVID-19, and a complex of genomic studies are given in /1, 3-7/.

We have compiled graphs showing the statistics of mortality from coronavirus depending on the age and type of chronic diseases according to the China Center for Disease Control and Prevention, Fig.2.

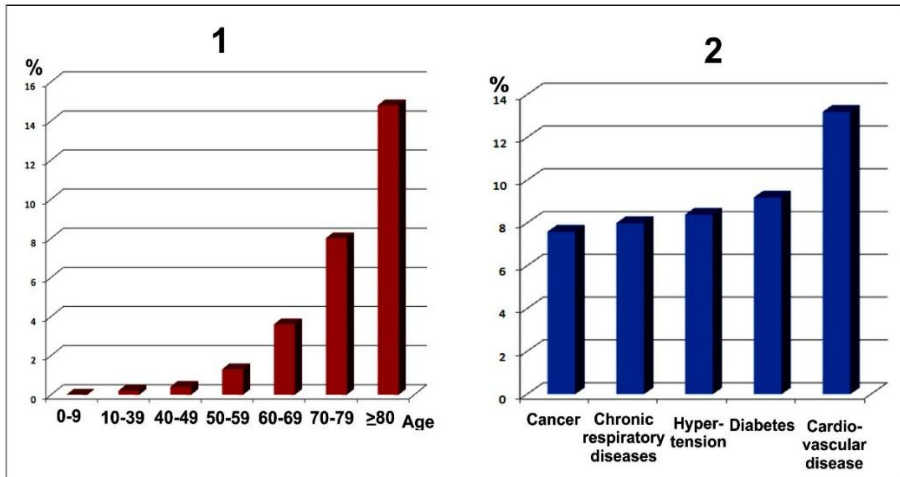


Figure 2: Coronavirus mortality statistics in%: 1 - depending on age; 2 - depending on chronic diseases. (These conclusions are based on 72,314 cases studied according to the /9/).

A study by Chinese scientists / 8 / based on a statistical analysis of coronavirus patients in Wuhan Pulmonary Hospital and Jinyintan Hospital in Wuhan revealed very important trends and patterns of the main risk groups for Covid-19 infection. The following is table 2 given in / 8 /.

Studying the data in table 2 and graphs in figure 2. we understand that one of the main tasks for scientists is the development of methods and appropriate drugs that can minimize the likelihood of a decrease in immunity and the possibility of infection with coronavirus for people with a high risk of morbidity.

Table 2. Characteristics, interventions and outcomes of the study population in Wuhan Pulmonary Hospital and Jinyintan Hospital.

Table 2.

Characteristics	Total N = 191	Wuhan Pulmonary Hospital N = 56	Jinyintan Hospital N = 135	p
Age (yrs)	56.0 (46.0, 67.0)	55.5 (47.0, 66.0)	56.0 (46.0, 67.0)	0.93
Male	119/191 (62%)	33/56 (59%)	86/135 (64%)	0.54
Exposure history	73/191 (38%)	23/56 (41%)	50/135 (37%)	0.60
Current smoking	11/191 (6%)	4/56 (7%)	7/135 (5%)	0.60
Comorbidities	91/191 (48%)	31/56 (55%)	60/135 (44%)	0.17
Hypertension	58/191 (30%)	16/56 (29%)	42/135 (31%)	0.73
Diabetes	36/191 (19%)	13/56 (23%)	23/135 (17%)	0.32
Coronary heart disease	15/191 (8%)	6/56 (11%)	9/135 (7%)	0.36
Chronic obstructive lung disease	6/191 (3%)	1/56 (2%)	5/135 (4%)	0.47
Carcinoma	2/191 (1%)	1/56 (2%)	1/135 (1%)	0.52
Chronic kidney disease	2/191 (1%)	0/56 (0%)	2/135 (1%)	0.36
Others	22/191 (12%)	7/56 (13%)	15/135 (11%)	0.78
Respiratory rate > 24 /min	56/191 (29%)	5/56 (9%)	51/135 (38%)	<.0001
Pulse ≥ 125 beats/min	2/191 (1%)	1/56 (2%)	1/135 (1%)	0.52
Systolic blood pressure < 90 mmHg	1/191 (1%)	0/56 (0%)	1/135 (1%)	0.52
Fever (Temperature ≥ 37.3 °C)	180/191 (94%)	54/56 (96%)	126/135 (93%)	0.38
Cough	151/191 (79%)	43/56 (77%)	108/135 (80%)	0.62
Sputum	44/191 (23%)	12/56 (21%)	32/135 (24%)	0.73
Myalgia	29/191 (15%)	7/56 (13%)	22/135 (16%)	0.51
Fatigue	44/191 (23%)	13/56 (23%)	31/135 (23%)	0.97
Diarrhea	9/191 (5%)	4/56 (7%)	5/135 (4%)	0.32
Nausea or vomiting	7/191 (4%)	1/56 (2%)	6/135 (4%)	0.34

The categories of high mortality from coronavirus include people with concomitant diseases of the cardiovascular system (13.2%), diabetes (9.2%), hypertension (8.4%), chronic respiratory diseases (8%) and cancer patients (7.6%).

By age categories, old people aged ≥80 years old (maximum risk), 70-79 years old (very high risk), 60-69 years old (high risk) are at maximum risk.

Currently, many research institutes, universities and medical institutions of the world are involved in the development of an effective vaccine against COVID-19, in which leading scientists of various fields of science participate: medicine, microbiology, virology, pharmaceuticals, genetic engineering, biochemistry, biophysics and others. Scientists from China, the USA, Russia,

Israel, Great Britain, France and other countries have already reported on their first successes.

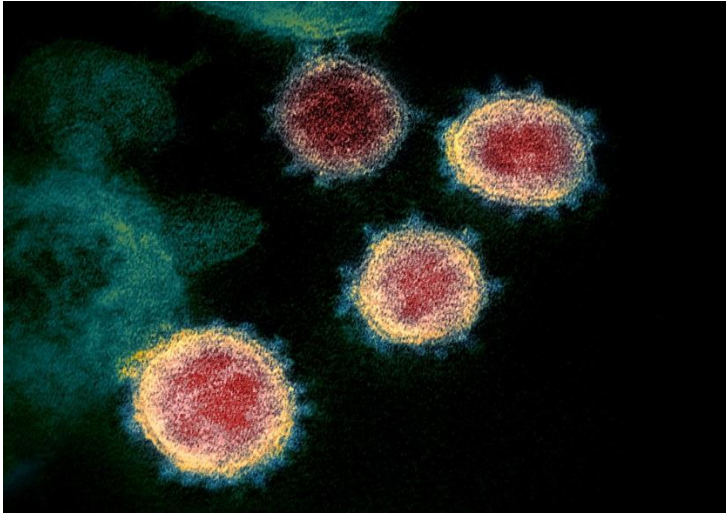


Figure 3: This image showing SARS-CoV-2. The spikes on the outer edge of the virus particles resemble a crown, giving the disease its characteristic name /11/.

In figure 3. shown transmission electron microscope image shows SARS-CoV-2, the virus that causes COVID-19, isolated from a patient in the US, emerging from the surface of cells cultured in the laboratory. If we can see our enemy Covid-19, then why can't we defeat him?

In mid-March, the World Health Organization listed 41 candidate vaccines, which are being developed around the world. Meanwhile, according to the WHO, until the complete development of the coronavirus vaccine and its practical use, it will take at least one year / 10 / and some experts call the period 1.5 years. If the development of the pandemic continues according to the current scenario, in one year, according to our estimates, from 2.5 million (with an optimistic forecast) to 10 million people around the world can die.

Scientists all over the world are directly responsible because of the helplessness of modern science before the coronavirus pandemic. We, scientists from different countries, must join forces to prevent the development of the situation according to the worst-case scenario. We should not wait idly of creating a vaccine.

In addition, the vaccine can only help those who have not yet become infected with coronavirus. And what about those millions of people infected with

coronavirus at the time of the creation of the vaccine, which the vaccine will not only not help but also contraindicated? How to treat them? In the process of competition between scientists and pharmaceutical companies to create a vaccine against coronavirus, millions of predicted infected people are remain defenseless against coronavirus. Maybe it makes sense to borrow the experience of China and not wait for the vaccine to appear, but use other mechanisms to combat coronavirus?

In addition to isolation and strict adherence to hygiene rules, there are other ways to significantly reduce the rate of pandemic and minimize the risk of infection for categories of people with an increased risk of infection and death from coronavirus.

Studies by Chinese scientists on the use of traditional Chinese medicine (TCM) in the prevention and treatment of coronavirus fully confirm our opinion on the high efficiency of the use of non-drugs aimed at enhancing the body's immunity and preventing the disease in people with high risk of contracting coronavirus with chronic diseases: cardio -vascular system, diabetes, respiratory tract, cancer, etc.

So, the director of the ABSL-2 laboratory at the Institute of Traditional Chinese Medicine at the Academy of Chinese Traditional Medicine, Dr. Tsui Xiaolan, said that TCM drugs improved immunity and cured many inflammatory processes and chronic diseases of patients with coronavirus and significantly reduced the risk of mortality. Yu Yanhong, secretary of the party committee of the State Administration for Traditional Chinese Medicine and Pharmacy of the People's Republic of China, said that "Clinical observation shows that traditional Chinese medicine (TCM) has proven effective in treating more than 90% of patients with confirmed COVID-19 in mainland China." /14/

One of the ways that have great prospects in the fight against the coronavirus pandemic is the use of already known immunostimulating drugs that also have antiviral activity, primarily for pulmonary diseases, and are highly effective detoxifiers that remove toxins from the body, including those produced by viral and bacterial infections. These drugs do not always belong to the class of drugs and may be mineral nutritional supplements.

In our opinion, these drugs include mineral nutritional supplements based on natural clinoptilolite zeolite. We have extensive experience in clinical and laboratory tests of one of the very effective drugs of this class - the mineral food

supplement «AZEOMED». The drug «AZEOMED» was developed and successfully tested by Azerbaijani scientists in collaboration with colleagues from Germany and Austria. Its development and research was carried out in the Azerbaijan Section of the International Academy of Sciences "Health and Ecology", the International Scientific and Technical Complex "Intergeo-Tetis", the Scientific and Production Company «AZERZEOLIT», and "Yeni Tex" Ltd.

In the process of researching the drug «AZEOMED» at different times, various scientific institutes, universities, medical institutions and international organizations participated. The drug «AZEOMED» has shown good results for more than 20 years of clinical and laboratory tests, the results of which have been published in dozens of scientific articles and books /12/. Thus, as a result of clinical and laboratory tests, it was proved that the drug «AZEOMED» is effective in the prevention and treatment of pulmonary tuberculosis, pneumonia, bird flu H5N1, polio, diabetes mellitus, diseases of the gastrointestinal tract, hypertension, cardiovascular system, cancer and a some of other diseases /12,13/. In the course of clinical and experimental studies of the «AZEOMED» mineral complex, various preparations were developed based on the natural zeolite-clinoptilolite of the Aydag deposit and its compositions with some minerals and medicinal plants, vitamins and other components. These drugs showed high antiviral activity, and proved to be active detoxifiers and antioxidants.

In the process of researching the drug «AZEOMED», more than 20 patents were obtained for various prescription compositions of «AZEOMED», designed to solve various problems of human health /1-11/.

A number of other drugs based on natural zeolite-clinoptilolite have also shown high efficiency in the prevention and treatment of these and other diseases /15-17/.

2. ZEOLITE - CLINOPTILOLITE OF THE “AYDAG” DEPOSIT, ITS STRUCTURE AND PHYSICOCHEMICAL PROPERTIES

by Prof. Dr. Elchin Khalilov, Azerbaijan

2.1. Introduction

Natural clinoptilolite-zeolite is a microporous tuff stone, aluminum silicate with channels of a crystal lattice of 0.4 nm, filled with ions and water. The zeolite crystal lattice originated millions of years ago from volcanic lava and

lava ash, expelled during eruptions and falling into the sea, in combination with colloidal boiling sea water. Zeolite may contain all the elements of the periodic table.

In the works /18,19/ the properties, production and use of natural zeolite in various fields, including medicine, are described in detail.

Zeo comes from the Greek zein, which means boil. Lite comes from the Greek "litho", which means stone. Thus, zeolite is translated as “boiling stone”, since when heated, it begins to intensively release the fluids present in its pores, which resembles the boiling process.

In 1756, zeolite was first described by the Swedish mineralogist Kronstedt. There are three forms of zeolite: phase, layered (layered) and crystalline. Clinoptilolite-zeolite is one of the crystalline forms. The main structure of clinoptilolite-zeolites is a crystal lattice with hollow spaces of about 4 Angstroms (1 Angstrom = 10^{-10} m = 0.1 nm).

To date, at least 34 minerals have been discovered in natural zeolites (clinoptilolites). Often they are present only in traces, as required by a living organism of a highly developed species. Most of the elements of the periodic table are contained in zeolites. Therefore, zeolite-clinoptilolite is excellent for treating people and animals.

2.2. Zeolite crystal lattice

The clinoptilolite crystal lattice is created by a three-dimensional lattice. It consists of silica tetrahedra $(\text{SiO}_4)^{4-}$ interconnected by oxygen atoms, and some of the silicon atoms are replaced by aluminum atoms $(\text{AlO}_4)^{5-}$. Thus, a characteristic spatial structure is created, characterized by a significant number of pores, which, when connected together, create small, which are metal cations, or water molecules. The total volume of these pores is 24 - 32%.



Figure 4: Natural zeolite of the Aydag deposit (Tovuz region of Azerbaijan).

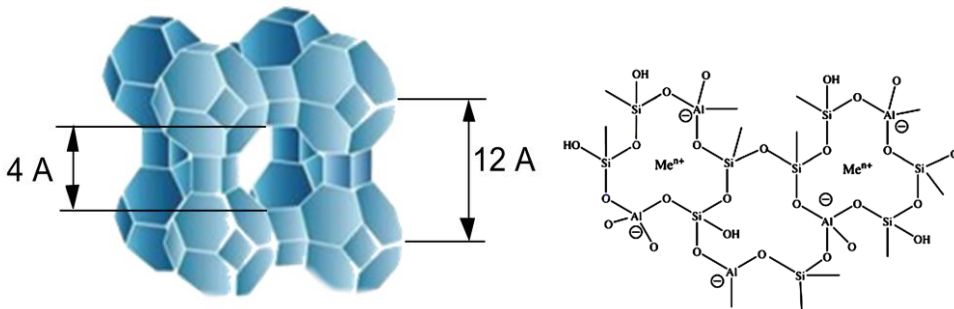


Figure 5: Crystal structure of a natural clinoptilolite zeolite.

Natural zeolite-clinoptilolite has the following specific physicochemical properties:

- intense ion exchange and selectivity;
- reversible hydration and dehydration;
- extremely high gas absorption capacity;
- high temperature resistance;
- resistance to aggressive environments;

Natural zeolite-clinoptilolite is characterized by high heat resistance and resistance to aggressive substances, in particular to acids and ionizing radiation. In humans and animals, no harmful effects were found with prolonged use in tolerated doses of drugs based on natural clinoptilolite

zeolite. Natural clinoptilolite-zeolite acts as an auto-bioregulator (autopilot) in humans and animals, with hydrated SiO_2 playing a major role.

2.3. The chemical composition of the zeolite-clinoptilolite of the Aydag deposit

Clinoptilolite-zeolite deposits on our planet do not have the same composition. An essential factor is the Si/Al ratio. This should be at least 1: 4.

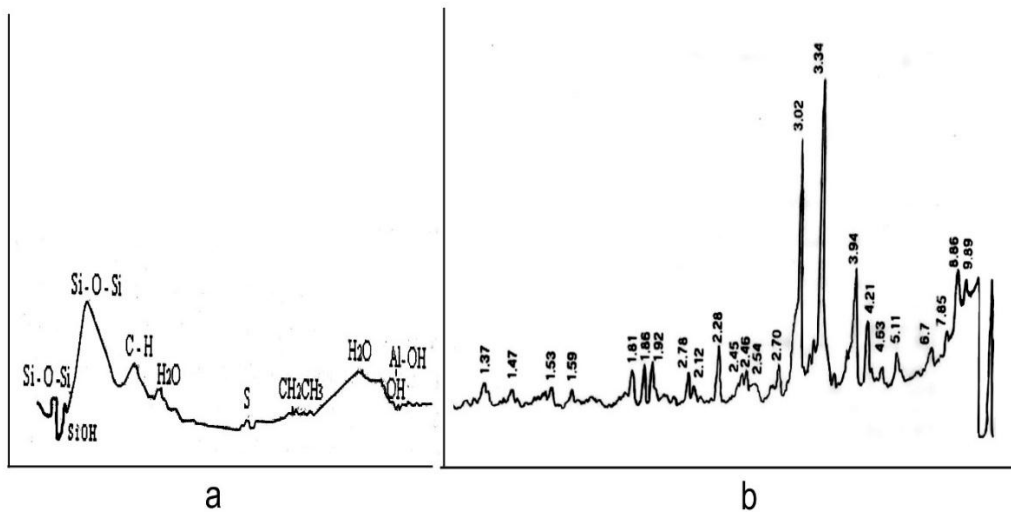


Figure 6: (IR) spectrum (a) and diffractogram (b) of the natural zeolite of the Aydag deposit.

Исследования природного цеолита Айдагского месторождения осуществлялись рядом методов и приборов. Так, Гамма-спектрометрический анализ осуществлялся с помощью гамма-спектрометра SARI-2. Кроме того, исследования проводились на рентгеновском дифрактометре ДРОН-1 и с помощью ИК (IR) спектрометра.

Studies of the natural zeolite of the Aydag deposit were carried out by a number of methods and instruments. So, gamma spectrometric analysis was carried out using a SARI-2 gamma spectrometer. In addition, studies were carried out on a DRON-1 X-ray diffractometer and using an IR spectrometer. In figure 3. shown: IR spectrum (a) and diffraction pattern (b) of the natural zeolite of the Aydag deposit.

The oxide formula of clinoptilolite is : $(\text{Na}_2\text{K}_2)\cdot\text{O}\cdot\text{Al}_2\text{O}_3\cdot 10\text{SiO}_2\cdot 8\text{H}_2\text{O}$, and its crystal chemical formula is $\text{Ca}_{4,5}\cdot\text{Al}_9\text{Si}_{24}\text{O}_{72}$.

In the composition of the zeolite-clinoptilolite of the Aydag deposit, the Si / Al ratio is: 4.25 - 5.25

Table 3. shows the chemical and microelement composition of the natural zeolite of the Aydag deposit.

Table 3.

Chemical compound	Content in %		Name trace element	Content in%
SiO ₂	64,80		Be	0,0001
Al ₂ O ₃	10,80		Mn	0,02
Fe ₂ O ₃	1,30		Pb	0,002
TiO ₂	0,23		Mg	>1%
CaO	2,92		Sl	>1%
MgO	3,83		Ga	0,001
P ₂ O ₅	0,08		Fe	>1%
MnO	10,02		Sn	< 0,001%
K ₂ O	1,54		Al	>1%
Na ₂ O	2,48		Ti	0,1
SO ₃	0,02		V	0,003
Cu	<0.01		Cu	0,002
Zn	<0,01		Zn	0,01
ППП (Потери при прокаливании)	11,69		Zr	0,001
H ₂ O	5,32		Sr	0,03
			Ba	0,06
			Ca	>1%

2.4. Physical characteristics of the zeolite-clinoptilolite of the Aydag deposit

According to the conclusion of laboratory studies of the gamma spectroscopy department of the geological environment of the Institute of Geology of the National Academy of Sciences of Azerbaijan (06/01/2011), measurements using the SARI-2 gamma spectrometer showed that the natural zeolite-clinoptilolite of the Aydag deposit corresponds to the Technical

Conditions TŞAZ1781832-01- in terms of radioactivity 2001 and State standards (RSN-31-93, QOST 3010894, GOST 12.1.007-76) and can be used for the production of food additives.

Table 4. shows the physical characteristics of the zeolite of the Aydag deposit.

Table 4.

№№	Parameter Name	Parameter value
1	Specific Pore Volume V	0,34 cm ³ / g
2	Specific micropore volume V _m	0,13 cm ³ / g
3	Density γ	1,75 g / cm ³
4	Pore diameter d _k	4± 0,5 Å
5	Mechanical strength index	0,75 kg/mm ²
6	Heat resistance	≤ 640 ⁰ C

According to the conclusion of the Russian Research Center for Emergency Situations of the Ministry of Health of Russia, the natural zeolite-clinoptilolite of the Aydag deposit, in terms of the concentration of polychlorinated dibenzo-p-dioxins and dibenzofurans, complies with the permissible standards (PROTOCOL No. 1BD / 02, 08.07.2002).

Not every clinoptilolite-zeolite is suitable for medical purposes. Its suitability must be indicated in the appropriate passports.

Zeolite-clinoptilolite is a highly effective adsorbent. Studies have shown that natural zeolite adsorbs various substances hazardous to health. The zeolite lattice structure allows it to function as an ion-exchange filter and selective adsorbent. The adsorption and exchange of ions depends on their charge and magnitude. The larger the ion size corresponds to the pore size at the entrance to the clinoptilolite lattice, the easier they will be captured and delayed by the lattice. The inlet pore diameter is approximately 4 angstroms, which corresponds to the diameter of ammonium ions.

Zeolite-clinoptilolite adsorbs: ammonia, heavy metals, radionuclides, organochlorine and organofluorine compounds, arsenic, as well as most of the toxins released during the life of viruses, bacteria and fungi.

2.5. Aydag deposit of natural zeolite-clinoptilolite, its production, production and research

The Aydag natural zeolite deposit is located in the western part of Azerbaijan near the town of Tovuz in the Tovuz region. The extraction and processing of natural zeolite-clinoptilolite is carried out by the Scientific and Production Company «AZERZEOLIT», which was created on the basis of the Resolution of the Cabinet of Ministers of Azerbaijan in 1993 as a structural unit of the International Scientific and Technical Complex "Intergeo-Tetis" with the participation of the State Committee for Geology and Mineral Resources of Azerbaijan .

President of the International Scientific and Technical Complex Intergeo-Tetis and General Director of the Scientific and Production Association "«AZERZEOLIT»" from the moment of their creation to the present, is Elchin Khalilov - professor, doctor of geological and mineralogical sciences, academician of the International Academy of Sciences H&E, academician of the Russian Academy of Natural Sciences , President of the Azerbaijan Section of the International Academy of Sciences H&E (www.ias-as.org).

2.6. Implementation of scientific research, clinical and laboratory tests of the mineral composition «AZEOMED»

The coordination of research, clinical and laboratory tests of the «AZEOMED» mineral complex was carried out by the Azerbaijan Section of the International Academy of Sciences (IAS) "Health and Ecology" under the leadership of PhD Tamila Khalilova - Co-Chairman of the International Association "Zeolite - Health and Ecology" (Germany, Munich) , Corresponding Member of Azerbaijan Section of MAN H&E. The general management and financing of research and production of «AZEOMED» preparations was carried out by the Intergeo-Tetis International Scientific and Technical Complex and Yeni Tex Company.

More than 10 international and national patents of Azerbaijan / 124-134 / have been received for various prescription variants of the mineral composition «AZEOMED». Depending on the task, various prescription compositions may be used, including, in addition to the natural zeolite-clinoptilolite (basic composition), the natural mineral dolomite, medicinal plants, such as licorice

root, saffron, safflower and others, as well as individual vitamins and their complexes.

At different stages of scientific research, clinical and laboratory tests of the mineral complex «AZEOMED» participated:

- Azerbaijan Section of the International Academy of Sciences "Health and Ecology" - (Scientific guidance);
- International Scientific and Technical Complex "Intergeo-Tetis" (General Guide to the work);
- Yeni Tex Ltd. (Work coordinator);
- International Association: Zeolite - Health and Ecology (Germany, Munich);
- World Organization for Scientific Cooperation "Science Without Borders" (Germany, Munich);
- Department of Epidemiology and Microbiology of the Azerbaijan State Institute of Advanced Medical Studies named after A. Aliyev;
- Department of Pharmaceutical Technology and Management of the Azerbaijan Medical University;
- Research Institute of Pulmonary Diseases, Ministry of Health of Azerbaijan;
- St. Petersburg Medical Academy;
- State Scientific Center of Virology and Biotechnology "Vector" of the Federal Service for Supervision of Consumer Rights Protection and Human Welfare of the Russian Federation;
- Institute of Microbiology of the National Academy of Sciences of Azerbaijan;
- Department of Infectious Diseases of the Azerbaijan Medical University;
- Department of childhood diseases of the Azerbaijan Medical University;
- Republican Antiplague station named after S. Imamaliyev of the Ministry of Health of Azerbaijan;
- Research Institute of Hematology and Transphysiology. B. A. Eyvazov of the Ministry of Health of Azerbaijan;
- HIV / AIDS Center of the city of St. Petersburg of the Russian Federation.

3. PHYSIOLOGICAL, BIOPHYSICAL AND BIOCHEMICAL AND MECHANISMS OF THE INFLUENCE OF NATURAL ZEOLITE-CLINOPTILOLITEH ON THE HUMAN ORGANISM

by Prof. Dr. med. Karl Hecht and Dr. Yelena Savoley, Germany

3.1. Introduction

The role of minerals, trace elements and their compositions in the functioning of various physiological systems of the body is often underestimated. For example, if you think that you can compensate for the lack of calcium in the body by replacing calcium, you are mistaken because completely different processes occur in the human body due to the biological transmutation of minerals /20/. This will be commented below.

In the same vein, obesity is caused not by fatty foods, but by an excess of carbohydrates / 21; 22 /.

Minerals are integrated into all life processes that are contained in plants, animals and people. On the one hand, they form the main substance of the structure, that is, the skeleton of humans and animals, and on the other hand, they participate in every process of regulation in the body. There is not a single biochemical or biophysical process in the body in which minerals are not involved. They practically form an inorganic substrate of life and are its regulators.

Minerals are present in the human body in both dissolved and solid state and perform many functions, for example, regulation of the extracellular matrix, as part of the acid-base balance, osmolarity and volume of body fluids. They participate in the creation of liquid and solid substances, as well as connective tissues and are part of many functions, for example, in the hormonal system, lymphatic system, enzyme system and blood system. They also support the electrical activity of cells, extracellular matrix and tissues and are necessary for energy metabolism.

Electrolytes are minerals that have electrical conductivity because they dissociate into anions and cations. Electrolytes are essentially minerals in ionic form. Electrolyte balance is understood as the general metabolism of ions dissolved in body fluids. Examples of cations are Na⁺, Ca⁺⁺, Mg⁺⁺. Examples of anions are Cl⁻, HCO₃⁻.

Ions are mainly found in extracellular and intracellular fluids, where they can generate potential differences. It is in this form of electrolyte ions that minerals perform the functions of electrophysiological regulation of the entire human body. Consequently, the lack of minerals can not only lead to an imbalance of minerals, but also affect the electrophysical processes in their entirety and, consequently, the general homeostasis of the body, since they participate in many functions. There are no harmful or beneficial minerals and trace elements, but only harmful and useful surpluses or deficiencies in the body. This opinion is shared today by everyone who studies the areas of mineral metabolism and trace elements /23/.

The use of minerals and their compositions in the treatment and prevention of various diseases requires a scientific and responsible approach. Therefore, when using minerals in humans and animals, the following should be considered /24/:

- For biologically active use of minerals, three levels must be considered;
- Insufficiency;
- Optimal;
- Toxicity;

Back in 1920, Bertrand pointed out that the following is important when considering microelements and macroelements:

- With an absolute deficit death occurs;
- If the supply of the body with minerals is limited, the body can survive, but will experience a borderline state of deficiency;
- If there is an excess of one or more elements, a state of “limiting toxicity” occurs, which ultimately can lead to serious diseases;
- The systemic regulatory principle of minerals used in the body should be taken into account;
- It is important not to take large doses of one or another macroelement or microelement. Excessive consumption can even be harmful to health, causing changes in the balance of mineral metabolism.

3.2. The principles of regulation of beneficial minerals and trace elements in the human body

It is important to ensure the correct ratio of minerals in the body. Thus, systemic thinking and action are necessary when working with minerals. In addition, appropriate knowledge of bioregulatory mechanisms is needed.

According to Shalmina and Novoselov /25/, systemic interactions of various macroelements and microelements within the body occur at different regulatory levels and in flexible antagonistic and synergetic interactions. It was shown /23/ that the coenzyme function inherent in many minerals obeys intersystem and system-system principles.

Therefore, when assessing metabolic disorders, attention should first be paid to the systemic reactions of minerals. The absorption of the minerals used may, for example, depend on the systemic levels of macronutrients and trace elements present in the body during the use of minerals [26]. Due to the complex nature of the functional synergistic and antagonistic relationships in mineral metabolism, testing only for individual trace elements and macrocells is actually inadequate unlike the regulatory processes of the body /27/. Based on the knowledge gained, Shalima and Novoselov /25/, referring to Enslinger /28/, described the following schematic model of the relationship of various elements of the mineral metabolism of the body.

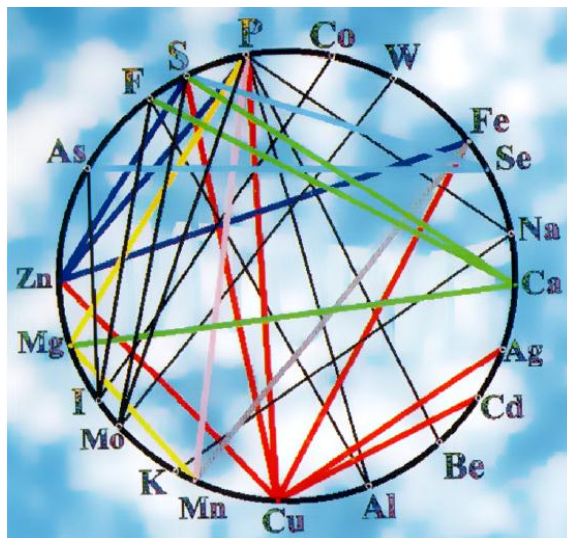


Figure 7: A simplified diagram of the functional interactions of certain minerals in the body (according to Enslinger 1986 and Shalmina and Novoselov 2002).

These interactions between the individual elements show that if one of them is absent or in abundance, it will affect a number of others, and the regulatory system may be “shocked”. The world's population suffers from Dismineralosis (malnutrition and metabolism). Current scientific opinion points to an alarming increase in the negative environmental burden of humanity. The

natural metabolic cycles of the environment, as well as humans and animals continue to deteriorate due to environmental pollution.

Consequences: poor health, immunodeficiency, autoimmune disorder, tumor disorders and other chronic disorders, depression, sleep disturbances and others increase /29/. The elementary principle of regulation of mineral metabolism, and thus of the extracellular matrix, is particularly affected.

Novoselov /25/ points out that the polluting burden experienced by almost all animals and humans today has not only complicated the systemic relationships in mineral homeostasis, but also causes an imbalance or systemic dysregulation (which is often chronic).

Blocking receptors with an excess of environmental toxins leads to a decrease in the absorption of basic minerals.

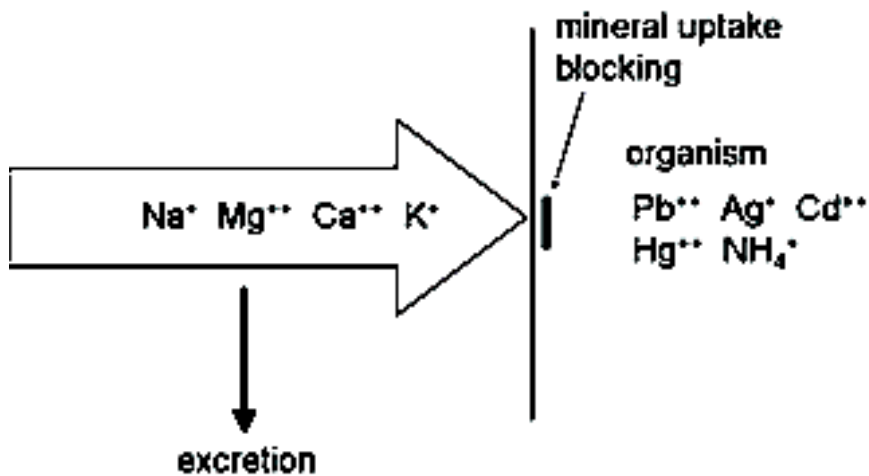


Figure 8: Dismineralosis regimen. Essential minerals cannot be absorbed by the body and removed from the body again (Hecht and Hecht-Savoley 2008).

If minerals must be used, this excess of “pollutants” must first be eliminated. Otherwise, the minerals used will not have an effect or will simply be eliminated from the body again. Today, this is true for almost everyone.

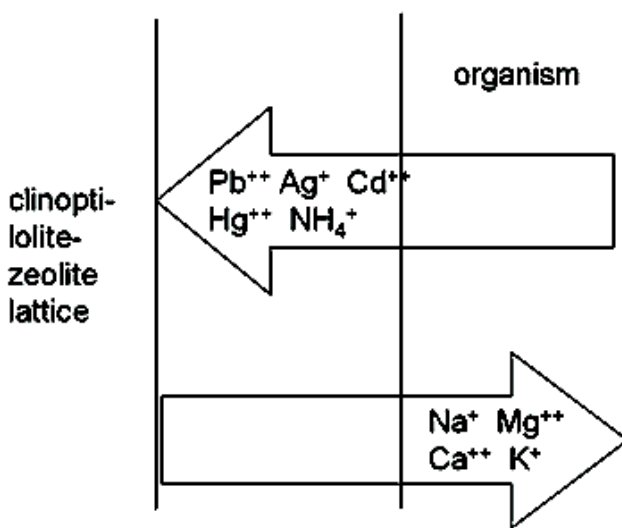


Figure 9: Functional state of a contaminated human body restored by ion exchange after taking natural clinoptilolite zeolite [Hecht and Hecht-Savoley 2008]

Pollutants will be attracted by the zeolite crystal lattice through physical forces. Ions released in the lattice can bind to the body's receptors and eliminate dysmineralosis, as well as oxidative stress. Zeolite also has radical scavenger abilities. Crystalline lattices fraught with pollutants are excreted with feces.

3.3. Therapists need sanogenetics with detoxification and bioregulatory functions

Therapists should be aware of SiO_2 -based bioregulators such as zeolite, silica (silicic acid), bentonite, montmorillonite and clays, at least as “pharmaceutical excipients”. They have an “autopilot function” and are able, thanks to their specific characteristics, to some extent balance the “ordinary” large unknown effects of the active ingredients.

Biophysical and biochemical mechanisms of action of these active ingredients are similar to the properties of the extracellular matrix of humans and animals, since they are part of its own evolution /30; 31/.

Many other studies have shown that silicic acid, which is formed in the presence of a specific organic compound, will have a specific adsorption capacity after removal of this organic compound, which is true for this particular

compound. This means that in silicic acid (SiO_2), different from other natural inorganic substances, memory was formed /30; 32; 33/.

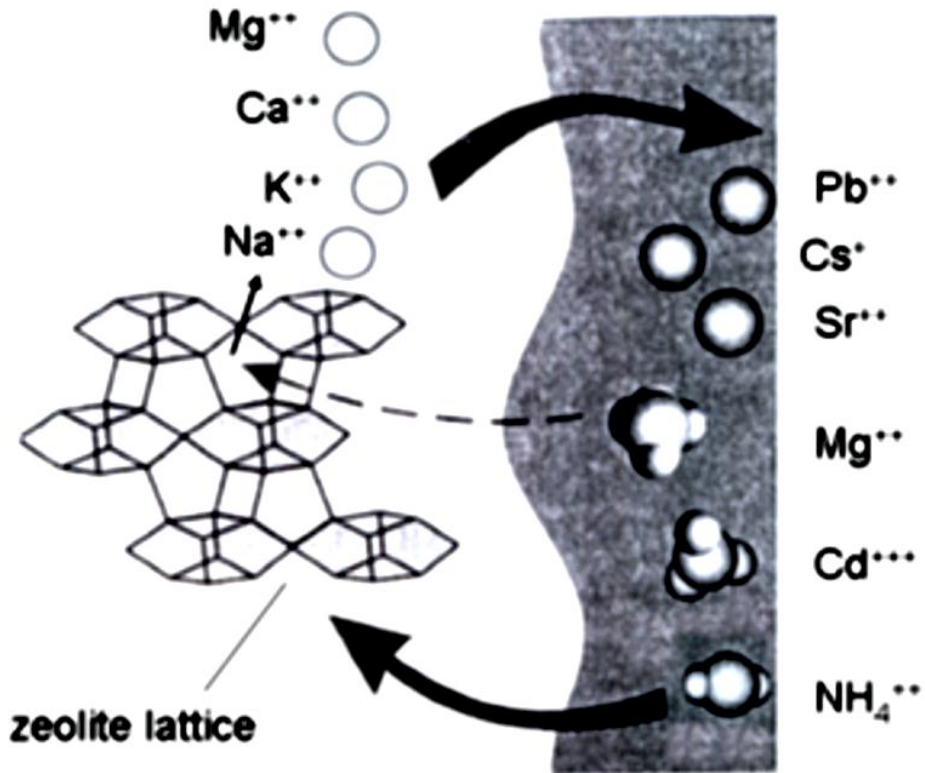
It is assumed that this characteristic of memory is reflected by “imprints” or “matrices” that remain on the surface of silicic acid (SiO_2) by the molecules of the organic “sample” in the form of their geometric molecular shape /33; 34; 33/.

The idea that silicon is involved in gene expression and, to a large extent, in DNA synthesis is shared by many scientists /36; 37; 38; 39/. Vulcani /38/ states that silicon-dependent genes exist and that silicon is necessary for the AMP cycle system, providing replication of AMP cycles. In this context, the work of Oschilewski et al. is interesting. It is worth mentioning /40/, who discovered that silicon particles are able to stimulate gene transactions through signals. SiO_2 is the only mineral on our planet that has biogenic properties. In addition, silicon in its various compounds after oxygen is the second most common element on our planet.

In ancient Greece, clay was used and called healing earth. In particular, the healing land from Lemnos was so popular that sometimes it was worth its weight in gold. Hippocrates (460-370 BC) gave young mothers healing land from the island of Samos for the purpose of "internal cleansing." Claudius Galen (129 BC - 201 BC), personal physician of the Roman emperor Marc Aurel, mixed the earth with water or Wine and prescribed this mixture to treat poisoning, fresh wounds, hemorrhoids, edema, diarrhea and skin diseases.

3.4. How does the adsorption mechanism work?

As indicated above, ground zeolite can significantly increase the adsorption surface area inside the body. Zeolite adsorption is associated with body fluids. This is the interaction process between the adsorbent and the adsorbate, which is established at the interface between body fluids and the surface of the adsorbent. Ion exchange and adsorption constitute a functional unit of action within the body.



**Figure10: Selective ion exchange, circuit
(Hecht and Hecht-Savoley 2005, 2008)**

Ion exchange occurs in the sense that pollutants have a strong affinity for clinoptilolite-zeolite lattices and that the cations present in the lattice are strongly attracted by organic substances in the body.

3.5. Detoxification function of zeolite-clinoptilolite

Based on scientific research, Shalmina and Novoselova /23/ would like to note that they very differentially described the detoxification mechanisms of natural zeolite-clinoptilolite, which depend on pore size and ion exchange function, as shown in table 5.

Table 5.

**Detoxification mechanisms of natural clinoptilolite-zeolite
 in various forms of endotoxycosis of humans and animals
 [according to Shalmina and Novoselov 2002]**

Endotoxycosis by	Mechanism of toxic substance elimination by natural clinoptilolite-zeolite
Endotoxins, such as acidosis products, cytokines, bacterial endotoxins, free radicals, metabolic end products	Adsorption in the macropores and mesopores of natural clinoptilolite-zeolite
Exogenous toxins	Adsorption in the macropores and mesopores of natural clinoptilolite-zeolite
Lower molecular compounds such as NH ₃ , H ₂ O, Cd ₄ , CH ₄	Adsorption in the macropores and mesopores of natural clinoptilolite-zeolite
Surplus levels of biogenic macroelements and microelements	Ion exchange
Heavy metals	Ion exchange
Radionuclides	Ion exchange

The detoxification properties of natural zeolite-clinoptilolite are achieved not only due to adsorption and ion exchange functions, but also due to the physical effects of the crystalline surfaces of zeolite-clinoptilolite and SiO₂. (Crystal surface detoxification /41/).

Due to the high content of silicon tetrahedra, natural zeolite is also able to participate in ion exchange, namely, in the release of SiO₂ and the formation of colloidal SiO₂. As its environment becomes more acidic, for example, due to the low pH in the stomach, even fixed aluminum and silicon cations from the lattice can participate in the process of adsorption ion exchange. In this process, the aluminum AlO₄ tetrahedron is removed (neutralized) and replaced with H₂O + ions in the hydrated form of the silicon tetrahedron. Gorokhov et al. /42/

described this process in a simplified form using the following equation:

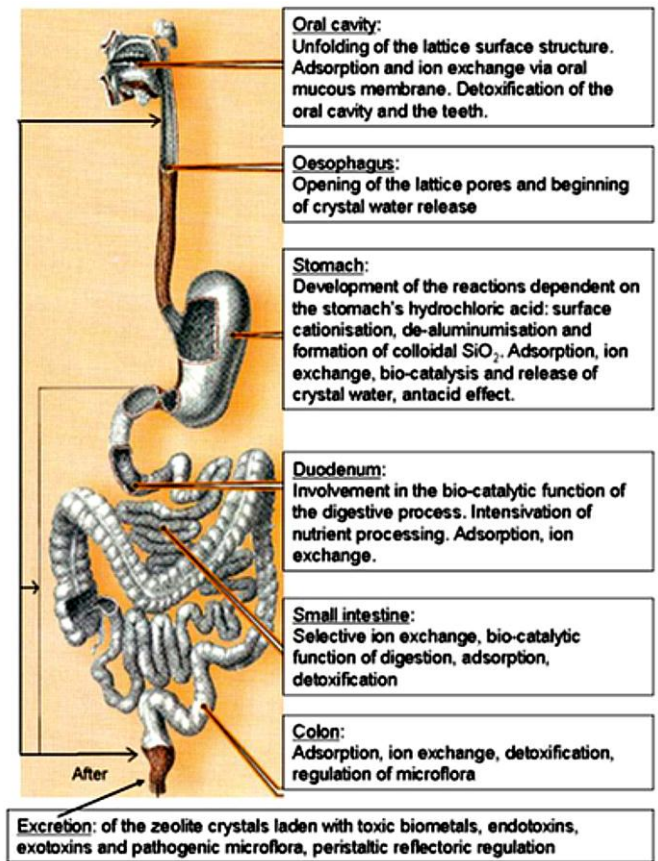
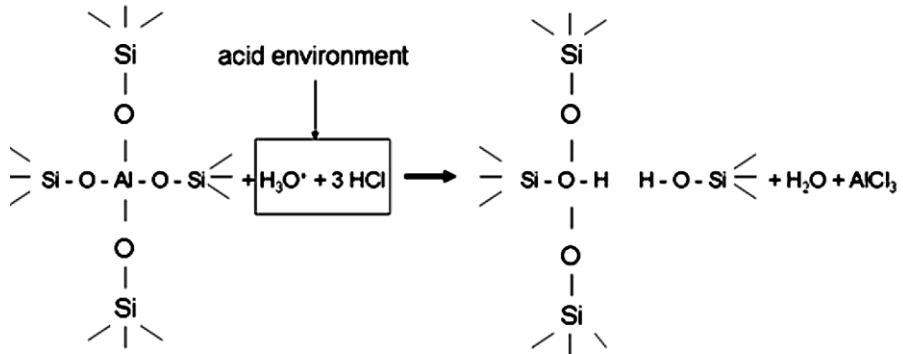


Figure 11: The mechanism of action of zeolite-clioptilolite in humans and animals. (modified in accordance with Belize and Novoselov 2006, Hecht, Hecht-Savoley 2008)

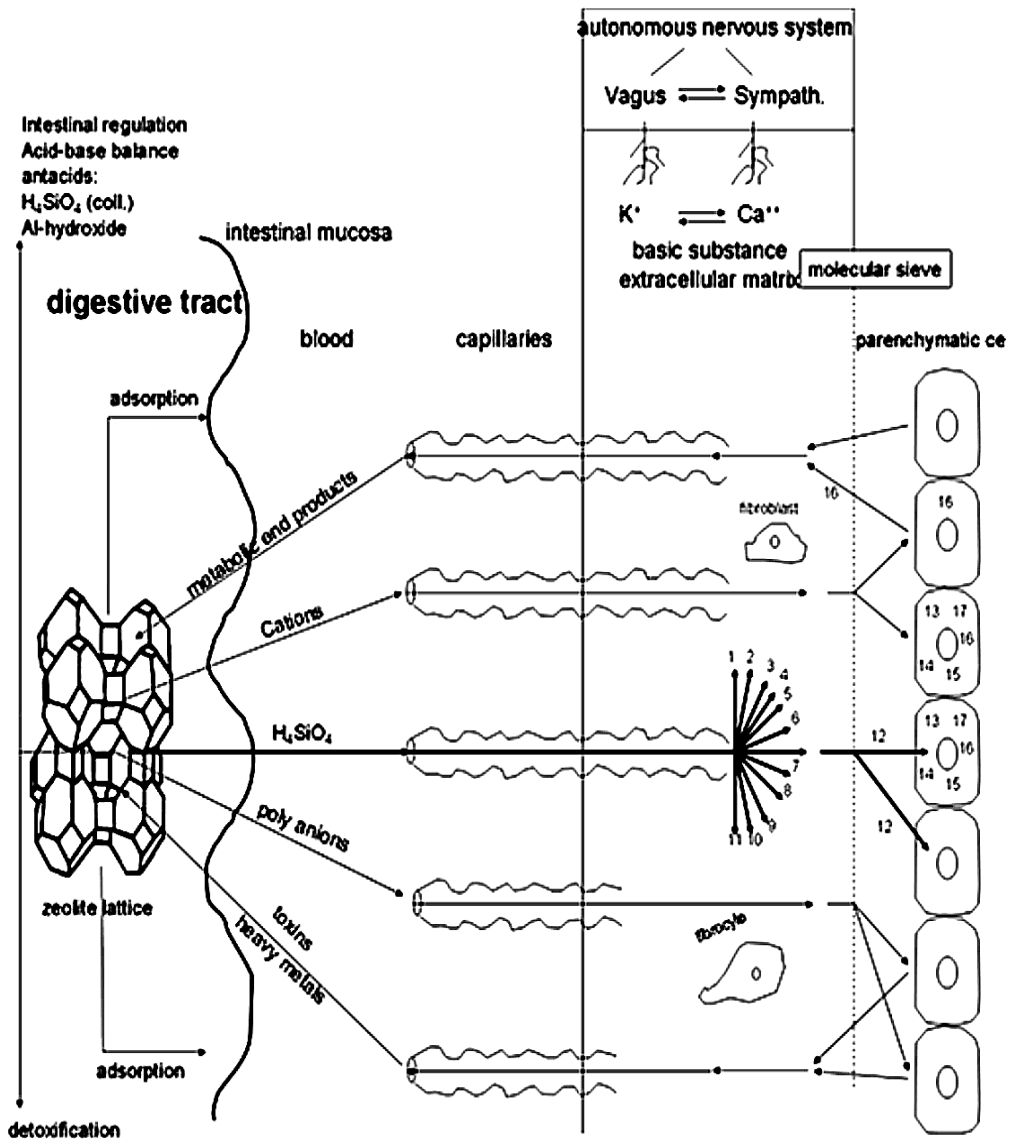


Figure 12: A simplified diagram: the processes within the body after oral administration of clinoptilolite-zeolite and the function of colloidal silicon (H_4SiO_4) in the extracellular matrix, cell membrane, cell and mitochondria (Hecht and Hecht-Savoiey 2005, 2008);

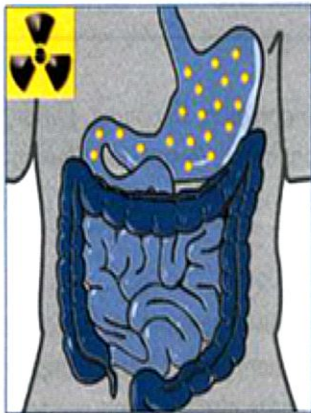
1 catalyst function; 2 hydration; 3 adsorption; 4 rhythms of time; 5 protein synthesis, synthesis of mucopolysaccharides, collagen, glucosaminoglycans, fibronectins, etc. 6 growth, healing; 7 non-specific immune function; 8 electrostatic binding; 9 colloidal phase; 10 mineral homeostasis; 11 acid-base homeostasis; 12 construction, stabilization, protection and repair of cell membranes; 13 intracellular matrix: respiratory chain → exchange of energy and information; 14 respiratory chain → mitochondrial matrix → information exchange → ATP mechanism; 15 gene regulation; 16 Na ↔ K: intracellular and extracellular matrix; 17 gene transaction.

Natural clinoptilolite-zeolite is a natural donor and applicator of SiO₂. Reception of clinoptilolite-zeolite and montmorillonite while taking a sufficient amount of fluid and daily exercise are sufficient to safely meet the human body's need for SiO₂. This is especially true for older people who want to stay young.

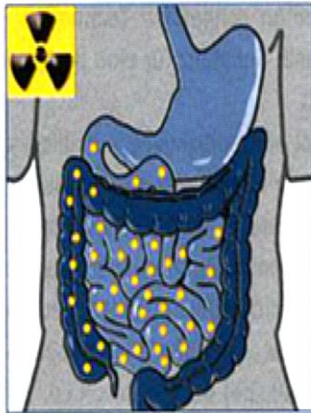
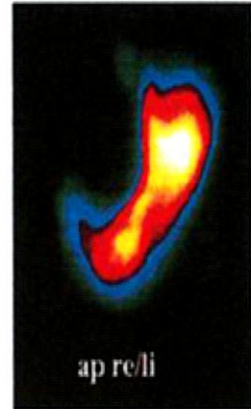
3.6. Study of the absorption behavior of active clinoptilolite in the human digestive tract using isotope labeling

Daskaloff /43/ confirmed using isotopic labeling studies that clinoptilolite-zeolite is not absorbed in the human intestines, but rather excreted from the body.

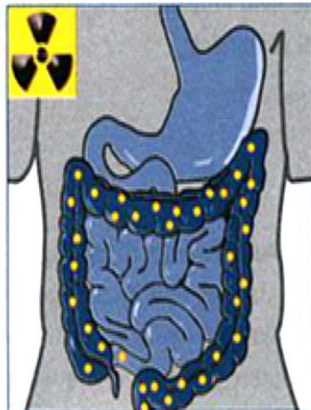
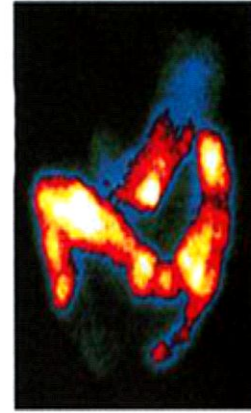
“The study showed that activated clinoptilolite-zeolite (ACZ) is not absorbed in the human intestines, but is completely eliminated from the body. The main residence time of the ACZ was measured in the gastrointestinal tract, which means that the ACZ is able to reveal its adsorption potential of heavy metals and toxins. In the study, the time between administration and excretion was about 24 hours. "No radioactivity was detected in the thyroid gland, nor in the lungs, nor in the kidneys, which would indicate the absorption of clinoptilolite-zeolite.”



Six minutes after uptake, radiation can be detected in the organ sectors stomach and duodendum.



Two hundred and forty minutes after uptake, the technetium-99m coupled MAC has completely the stomach and has partially reached the colon.



Twenty-four hours after the MAC uptake, almost all of the radiation can be detected in the colon and rectum, immediately before excretion.

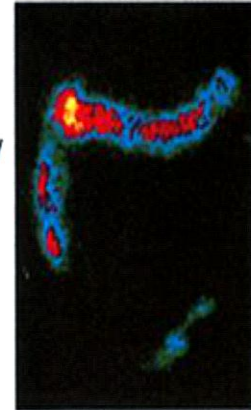


Figure 13: Behavior of isotope labeled activated clinoptilolite-zeolite while passing through the gastro-intestinal tract (Daskaloff 2005, source froximun: excerpts of available research results, November 2006, p. 41-42)

4.SCIENTIFIC RESEARCH AND EXPERIENCE USING THE DRUG BASED ON NATURAL ZEOLITE-CLINOPTILOLITE IN THE PREVENTION AND TREATMENT OF VARIOUS DISEASES

by Dr. med. Ilse Triebnig, Austria

Experience from my med. practice with over 2000 patients.

For decades I have been dealing with zeolite and its effect on following patient groups:

Oncology. Pat.

Diabet.II

Both groups of patients have some things in common, e.g. steatosis hep., damage of the microbioma, leaky gut, immunodeficiency.

Therefore I would like to discuss them together.

Oncology. Pat.:

Most of these patients who undergo chemotherapy and/or radiation suffer from the following **side effects**:

Steatosis hepatitis

Diarrhoea

Mucositis

Polyneuropathy

Emesis, nausea, sickness

Leaky Gut

Damage of the microbiome

Damage to the own immune defence

Steatosis hepatitis:

The non-alcoholic. fatty liver - NAFLD - is one of the most common diseases of the liver worldwide. Causes are environmental toxins such as pesticides, fungicides, heavy metal pollution but also drugs such as chemotherapeutics, antiepileptics, tetracyclines, psychotropic drugs.

Considering how many metabolic processes the liver is involved in, it is particularly important to avoid damage - here zeolite is one of the most valuable natural substances.

It is no coincidence that people living in areas with high zeolite deposits recognized the positive effects of zeolite centuries ago and applied Z.

I control the following values in my patients:

- GOT - glutamate-oxalacetate- transaminase
- GPT - glutamate pyruvate - transaminase
- Gamma-GT - aspartate - aminotransferase

The earlier I can give the affected person zeolite, the less these parameters increase into the pathological range. Between the individual chemotherapy cycles the liver values normalize, which leads to a significantly improved general condition, less vomiting, fatigue and loss of appetite.

Sometimes it also works against depressive mood.

Not to be overlooked are the antioxidative effect and the increase in the regenerative capacity of the liver.

Zeolite is also one of the most effective antioxidants.

The recommendation to my patients to take a foot bath with Z. every day has proven to be successful, as well as a Z. toothpaste.

In the last 10 years, the combination of zeolite with arabinoxylan has also proven to be effective.

This stimulates the growth of the nature killer cells and the B- and T-lymphocytes and also normalizes the above-mentioned liver parameters. It is also necessary to continue this therapy for up to 2 years after the end of chemo / rad., because most patients suffer from leukopenia and a cellular immune deficiency for a long time.

I would like to tell you the medical history of a colleague, a Prof. for nuclear medicine.

A success that encouraged us both to continue therapy with zeolite and Arabioxylan:

N. Pancreas, infiltrated into the liver, local metastases, diffuse peritonitis after a Whipple surgery with subsequent liver abscess.

After a single course of chemotherapy he refused it, especially since the prognosis was also very poor, with an expected survival time of about 2 months.

My therapy at that time 9 years ago was the following:

Zeolite, Arabioxylan, Curcuma, Probiotics and supplement of vitamins, trace elements and amino acids. The patient is in good health, heads his department for nuclear medicine and plays in a jazz orchestra in his spare time.

I may also mention that he refers all his pancreatic cancer patients to me for treatment.

Diarrhea:

One of the most common side effects that negatively affects the entire metabolism, can lead to fluid loss, vitamin and mineral deficiencies. Especially orally taken chemotherapeutic drugs like 5-FU and Gemcitabine cause diarrhoea with additional unbearable abdominal cramps. Patients not only lose fluid, but also minerals, vitamins and nutrients.

The consequences can be serious. Depending on the frequency of diarrhoea, I prescribe a daily intake of zeolite at least 3 times a day, in severe cases best before each meal.

I would like to describe here a particularly severe case that caused my patient and her attending doctors to despair.

She was predicted a survival time of only a few weeks. Her diet consisted of watery cooked rice.

Daily emptying was done about 20 times.

Pat. female. Born 1944

1997 B-cell lymphoma stage 3 - CHOP

Scheme

2009 N. Ovarii G3 T3c N1 L1 V1 - Histo: poorly differentiated serous papillary ovarian carcinoma - extirpation of the adnexa, debulking, sigmoid resection.

From 2009 to 2013 ongoing chemotherapy.

Diarrhoea could be controlled with zeolite several times a day with every small rice meal. Additional booster infusions were well tolerated. The recovery took about 12 months. Since then, she has always carried zeolite with her because she is firmly convinced it has saved her life.

Let me be brief - now in 2020, the patient is in good health, can eat normally, is also active in sports and is tumour-free!

This experience with zeolite as a substance that is not only hydrophilic is not an isolated case in my practice. Every short bowel syndrome receives zeolite from me, whereby the normalization of the electrolyte metabolism plays a very important role.

With zeolite one does not only ingest a substance that has a hydrophilic effect, but also takes advantage of the property of the ion exchange (trace element homeostasis, promotion of enzymes), absorption of pollutants and release of ions.

Mucositis

A sometimes painful side effect of certain chemotherapeutic drugs. Inflammation of the oral mucosa, often associated with aphthae and periodontitis, can be prevented by advising patients to rinse their mouths with zeolite powder several times a day. A suspension with sage tea, arnica, chamomile and other medicinal herbs is gladly accepted.

In an extreme emergency, when the chemotherapy is accompanied by radiotherapy, as in the case of tongue and larynx carcinoma, I add a few drops of lidocaine to relieve the pain.

It is important to minimise the pain so that the patient does not shy away from fluids and food for fear of it.

Zeolite applied directly to aphtae or herpes blisters has an even better effect. Zeolite ointment can also be used. The effect of zeolite on herpes viruses should be investigated more closely.

Oral hygiene is of particular importance for immunocompromised persons. See also the instructions of Prof. Hecht.

Polyneuropathy

I always take time for my patients to learn more about their condition. As a result, I was told that the Z. powder I prescribed for the liver also had an effect on the sensitive and sometimes motor disorders of the hands and feet.

Curious, I observed and documented the individual cases, and there are now hundreds of them. It turned out that polyneuropathy occurred in a high percentage, especially when treated with platinum derivatives, epirubicin and taxanes. With simultaneous administration of zeolite, the sensitive and motor disfunctions were reduced, only to be perceived more strongly again after the next cycle.

For this reason, I continue the treatment with zeolite for months after the end of the chemo until the symptoms have ceased.

Polyneuropathy is not a simple side effect. Apart from the difficulties of holding objects, or not being able to see the floor and stumbling, it can also cause an occupational disability.

At a congress in Milan I met Prof. Memo, a neuropathologist and epigeneticist from Brescia, who agreed to support a study - a very interesting positive story.

Based on my experience and documentation, a double-blind study could be started in Naples in 2014 under the lead of Prof. Carteni. The result, which is already known to me, is, as expected, extremely positive. Unfortunately, the presentation planned for April/May cannot take place at the moment due to the coronavirus in Italy.

Intestinal Microbiom

"Our intestine is the most densely populated microbial ecosystem on our planet" - quote from Prof. Wolfgang Schumann, Director of the Genetics Institute of the University of Beyreuth.

In the womb our intestine is still completely sterile. Children who are born naturally (vaginally) absorb the mother's bacterial flora during birth. Just a few minutes after birth, bacteria, fungi and viruses settle on the skin, in the oral cavity and in the digestive tract - the microbiome begins to form. Important for a healthy microbiom is the density and variety - diversity.

So far only a fraction is known about intestinal bacteria.

The tasks of the microbiome:

Protection against pathogenic germs. A layer of mucus protects the intestinal wall against the penetration of pathogenic germs.

In case of a damage of the normal intestinal flora by drugs, toxins, chemotherapeutic agents, radiation, antibiotics and cortisone, gaps in the mucus/epithelial layer are developing, which are referred to as Leaky Gut and which are (co-) responsible for inflammation and other systemic stress to the organism (e.g. irritable bowel, UCD, MC, autoimmune, liver).

Activation of the body's own regulatory systems: Messenger substances from the intestines have contact with our brain - the abdominal-brain axis.

Breakdown, i.e. chem. processing of otherwise indigestible food - like cellulose, for example.

Synthesis of vitamins: Vit B1, B2, B5, B6, B12 and also Vit K2 can only be synthesized by intestinal bacteria.

Programming of the immune system: if pathogenic germs enter our digestive system and the microbiome is overstrained and no longer able to defend itself, immunocompetent cells in the mucosa are informed and pass this information on to the immune system, thus initiating the production of antibodies. If all these tasks of the microbiome, the balance, diversity are disturbed, vitamin deficiency, anaemia, inflammation, ulcers up to perforation and general immune deficiency can result.

This is the reason for the enormous importance of zeolite as a potential therapeutic agent:

Elimination of pathogens

Establishment of the acid-base balance

Combating the LEAKY GUT (and associated symptoms)

I consider it very useful to administer a probiotic together with zeolite to build up the intestinal flora. all three barrier systems must be restored -

The intestinal wall, the mucus layer, the bacterial colonization.

The leaky gut:

This is a "leakage" of the intestinal wall caused by stress, toxins, drugs, pathogens of any kind.

Beside the barrier function the intestinal mucosa with the intestine-associated lymphatic tissue (GALT) forms the centre of our immune system.

Zeolite has proven in a placebo-controlled, double-blind study that it can bring the "loosened" tight junctions (too high intestinal permeability) back to a normal state. As such, zeolite can help to avoid heavy systemic pathol. damages for our organism (study Prof. Lamprecht -Graz).

If L.G. is suspected, the following parameters can be measured:

Secr. IgA, zonulin, calprotectin and alpha 1 antitrypsin.

My experience and observations with Diab. II with zeolite.

For diabetics a large field of action for zeolite opens up. In many respects the disease symptoms are similar to those of carcinoma patients (pls. refer to chapter above)

Due to the impaired metabolic situation, the general cancer risk for Diab.II is increased.

With Colonca. by 30%, Pancreasca. 50%, Mammacarc. 20%, Carc. of Vesica urinae 20%.

The risk of liver cancer, renal tumours and oesophageal cancer is also increased.

Use of zeolite in:

- Steatosis hepatitis
- Renal failure
- Hypercholesterolemia
- Hyperlipidemia
- Oxid. stress
- Viral diseases - Herpes
- Carcinomania
- Reflux esophagitis
- Dermatoses, leg ulcers

Of 4 diabetics, 3 suffer from steatosis hep.

As already mentioned above, Z. is of eminent importance as a long-term therapy. The kidney also benefits from Z., as it can absorb ammonia and this already in the digestive tract.

I observed that Z. showed good results against helicobacter. It seems that Z. has taken away the ammonia shell from the helicobacter and thus made this bacterium vulnerable for the gastric acid.

At the same time, I observed a normalization of creatinine in patients I had actually prescribed Z. for the liver.

Patients who were no longer able to be treated by dialysis could thus be helped. Further studies are needed to demonstrate, whether dialysis may even be avoided or at least delayed. Consideration is to be given to the high number of dialysis patients, especially amongst diabetics.

The oxidative stress and free radicals also play a crucial role due to the diabetic's altered metabolic situation. I am also thinking here of the reduced performance capacity of diabetics as a result of increased lactate formation. It has been proven that Z. can influence the lactate formation, especially athletes benefit from it.

The effect of Z. on cholesterol and especially on triglycerides has also been proven several times.

Especially in a time when multimorbid people are threatened by the corona virus, one should not forget the manifold properties of zeolite:

Growth promotion of macrophages

Effect on viruses - see herpes

Stimulation of IL6 - delay of the aging process

Effect "on the immunological capacity of the intestine

Protec. effect on liver and kidney

"Conductor of the electrolytes" according to Prof. Hecht

Stimulation of tumor suppression proteins (Prof. Pavelic)

Polyneuropathy

Skin, hair, nails and bones are other very promising applications of zeolite.

In the process of research in 2011-2013, the drug «AZEOMED» was also tested. The results of my main research are published in / 44 /.

5.EXPERIENCE OF APPLICATION OF THE «AZEOMED» MINERAL COMPLEX (ON THE BASIS OF NATURAL ZEOLITE- CLINOPTILOLITE) FOR PREVENTION AND TREATMENT OF INFECTIOUS DISEASES

5.1. The effectiveness of the prevention and treatment of bird flu H5N1 using the mineral complex «AZEOMED»

In accordance with the agreement between the Federal Service for Supervision of Consumer Rights Protection and Human Well-being of the Ministry of Health and Social Development of the Russian Federation and the Ministry of Health of the Republic of Azerbaijan on cooperation in monitoring bird flu and preparing for an influenza pandemic of February 13, 2007, the State Scientific The Center of Virology and Biotechnology "Vector" in 2007-2008 conducted a study of the antiviral activity of experimental drugs «AZEOMED» based on Azerbaijani natural zeolite Aydag deposit. The studies were commissioned by YeniTech, a member of the "Yeni Tex" Ltd.

Antiviral activity was tested against a highly pathogenic strain of avian influenza virus A / chicken / Kurgan / 05/2005 (H5N1) obtained from the Department of Microorganism Collection of the Vector Scientific Center. All work with the H5N1 influenza virus, as well as with animals infected with this

virus, was carried out in accordance with the recommendations of WHO and the WHO collaborating Centers for influenza / 45.46 /.

10 animals were included in each control and experimental group of infected animals. Intranasal infection was performed under mild ether anesthesia. After the animals were initialized, they were observed for 14 days, the percentage of death, the average life expectancy, and the average change in body weight of the surviving mice in the control and experimental animals were evaluated.

6 experimental drugs were tested. The drug «AZEOMED» at a dose of 60 mg / kg when administered orally showed antiviral activity: the efficacy relative to the control was 53.9%, body weight increased by 0.7 g by the end of the experiment.

Thus, studies of the antiviral activity of experimental preparations based on the Azerbaijani natural zeolite of the Aydag deposit showed that the preparations «AZEOMED» and Ag clinoptilolite exhibit antiviral activity against the highly pathogenic avian influenza virus H5N1 /45, 46/.

5.2. The effectiveness of the prevention and treatment of pulmonary tuberculosis using the mineral complex «AZEOMED»

The authors of / 47 / conducted a clinical study on the preparation "«AZEOMED»" based on natural zeolite in the treatment of destructive forms of pulmonary tuberculosis in patients who were hospitalized in the Institute of Lung Diseases. For this purpose, two groups of patients were taken with newly diagnosed pulmonary tuberculosis in the phase of destruction, who had never received prior TB treatment. The core group included 20 male and female patients receiving «AZEOMED» in a dose of 500 mg. 3 times a day on a background of standard antituberculosis chemotherapy with five drugs ("isoniazid", "rifampicin", "pyrazinamide", "ethambutol", "streptomycin"). The control group consisted of 17 male and female patients with similar forms of tuberculosis, receiving only standard antituberculous chemotherapy without the use of zeolite.

The results of using natural zeolite «AZEOMED» allows us to speak about the effectiveness of this preparation in complex therapy of newly diagnosed patients with destructive forms of pulmonary tuberculosis / 47 /.

5.3. The use of «AZEOMED» complex for HIV infection-accompanied candidiasis

These studies were jointly conducted by the St. Petersburg Medical Academy (Russia), the Department of Infectious Diseases of the Azerbaijan Medical University and the Azerbaijan Section of the International Academy of Sciences H&E. The results of the use of the mineral complex «AZEOMED» for candidiasis of HIV infection /48/ were studied.

As a result of the research, the following conclusions were made /48/:

1. “«AZEOMED» preparation as a complex is received well on part of the patients. No allergic reactions, gastrointestinal disorders have been observed.
2. In particular, in patients taking «AZEOMED», 10-20 mk / l growth in numbers of CD4 cells from T-helper cells has been observed, which demonstrates the activity of cellular immune response in patients.
3. Signs of clinical improvement in patients, in particular, restoration of mucous membranes in the mouth, intestines, vaginal cavity, and disappearance of edema are accompanied by healing of erosions, painless process of swallowing in patients, disappearance of candidal deposits in the mouth.
4. It restores, in particular, the water-salt balance of the gastrointestinal system, the adsorption balance and enzyme-vitamin balance in patients. Attenuation of clinical signs, such as clinical improvement, improvement of peristalsis and defecation, disappearance of flatulence and pains, is observed.
5. «AZEOMED» has an absorbent effect on microorganisms and viruses present in the body, particularly in endothelial cells, lymph nodes of intestinal mucosa, removes neutralized pathogens and toxins from the body.
6. «AZEOMED» restores hematopoiesis, the water-salt balance, the enzyme balance, pH of the body, compensates for the lack of macro- and micronutrients and improves the body’s metabolism, oxidation-reduction reactions and enzyme activity.”

5.4. The cardiovascular system



As shown in part 1 of this work, patients with the cardiovascular system have the highest risk of coronavirus infection. Preparations based on natural zeolite-clinoptilolite, including «AZEOMED», are highly effective in the prevention and treatment of the cardiovascular system /49/.

So, Yakovlev A.V. in / 50 / notes that the aggravation of ischemic heart disease in elderly and old age is accompanied by a marked atherogenic lipid disorders. High intensity of processes of free radical oxidation on the background of reducing the antioxidant activity, which contributes to a protracted unfavorable nature of the disease in this group of patients. Adding of natural clinoptilolite mineral and antioxidants - a-tocopherol of ascorbic acid on the background of basic therapy promotes more rapid stabilization of the condition and improve the quality of life of patients with IHD of elderly and old ages. During it the mineral component is used in gentle doses of 1.5 g per day for 30 days.

В работе /51/ отмечается: «As it is known zeolites are known as excellent ion exchangers and contain more than 30 different metal cations (see chemical composition). Sodium and potassium are the leading elements, which play a major role in myocardial contractile function. Copper is a component of many ferments and proteins involved in redox processes, and it is responsible for fullfledged energy metabolism of the heart muscle. Having unique properties of ion exchange the zeolite supplies the body the missing elements and if there is lack of them and removes them from the body, if they are in excess.» The experience of using natural clinoptilolite zeolite in more than 200 patients of the Novosibirsk Regional Clinic (Russia) showed that the received effects allow to recommend the zeolite in complex treatment of atherosclerosis, which is one of the major causes of cardiovascular diseases.

Anti-atherosclerotic effect of zeolite-containing products is quite significant in such serious diseases such as angina pectoris, post-infarction and post-insult periods. In patients with hypertension was marked the strong enough tendency towards normalization of vascular tone, which allow to eliminate the meteosensitivity in 78% of patients.

“Thus, the use of mineral clinoptilolite leads to an improvement

of three main factors influencing on cardiovascular system:

- normalization of blood pressure as a result of reducing of atherosclerosis.
- reduction of body weight;
- normalizing” /51/

5.5. Diabetes

As noted in part 1, patients with diabetes mellitus are in second place in terms of risk of infection with coronavirus.

The effective use of natural clinoptilolite zeolite in the process of prevention and treatment of diabetes mellitus has been described in the Dr. Med Ilse Triebnig and in the work / 44 /. In addition, a patent was issued for a method for the treatment of diabetes mellitus using natural zeolite-clinoptilolite / 52 /. In patent the use of clinoptilolite of the zeolite of the Shivyrtyuy field as a means for the treatment of diabetes mellitus is proposed. The tool has a hypocholesterolemic effect, and also stimulates the regeneration of the endocrine part of the pancreas. Additionally, the drug enhances regenerative processes in the kidneys, liver, intestines; due to the binding and elimination of low molecular weight toxic substances, such as urea, uric acid, creatinine, etc., it reduces their toxic effect on the body, partially compensating for renal failure; stimulates reparative regeneration in the blood.

6. RESULTS OF RESEARCHES OF THE «AZEOMED» MINERAL COMPLEX AS AN IMMUNOSTIMULANT

by Prof. Doctor of Pharmacy Mahbuba Veliyeva

6.1. Introduction

It is known that in medical practice, a number of drugs used to treat and prevent various diseases (allergies, diathesis, asthma status, etc.), in the pathogenesis of which plays an important role the functional level of the immune system.

In clinical lymphology the considerable place is given to the development of effective methods of immunotherapy for the treatment of autoimmune diseases /53/.

In the literature there are reports on the methods of influence on the immune system to stimulate it in immunodeficiency. It is indicated the need to carry out a number of activities, including drug and endolymphatic saturation with immunostimulating agents /54/.

The ways and methods of impact on the immune system have a special place in the practical lymphology. There was shown the necessity of stimulating the immune functions of the organism in patients suffering from serious diseases with ex-ternal diverting of the lymph. The reducing of effectiveness of antibiotics, increasing of the rate and severity of postoperative suppuration, which is closely connected with the problem of immunity. It was determined that the most important part of the function of lymphatic system, and in the first place, lymph nodes, is participation in immune reactions.

It is known that with the thoracic duct lymph into the blood every day is entered such number of lymphocytes, that 5-20 times higher than their content in the blood. The degree of depletion of lymphocyte reserve in the body and the ability to their reproducing, determining by the lymphocyte composition in the blood and lymph, is not correlated with the degree of suppression of autoimmune reactions. The latter are suppressed to a greater extent than is decreased the level of lymphocytes. In the lymph there are all typical for blood the lymphocyte subpopulations, T-subpopulation is 85% of lymphocytes of the thoracic duct lymph and 65% of lymphocytes of lymph nodes. When draining the thoracic duct with each liter of lymph from the organism is removed from

$1,27 \times 10^9$ to $2,8 \times 10^8$ lymphocytes. Daily lost of the lymph is 2,4 liters. It helps to remove about $3,0 \times 10^9$ lymphocytes /54, 56, 59/. In the dynamics of long lymph-draining the quantity of lymphocytes, releasing from the thoracic duct, is reduced.

So, N.E Paulus et al. (1977) calculated that in the first week are released 10×10^{10} – 50×10^{10} lymphocytes, 3 weeks later the releasing of lymphocytes fell to 5×10^9 , the content of lymphocytes in the blood was also decreased /58/.

The studies were conducted at the Azerbaijan Medical University in the research laboratories of the following departments: pathological physiology, microbiology, pharmaceutical technology.

6.2. Research Material and Methods

The research material was «AZEOMED» in 500 mg. pills, in packages containing 60 and 120 pieces; for comparison purposes, a previously examined immunotropic preparation – glycyram in 0.05 mg. pills, in packages containing 30 and 60 pieces was used (monoammonium salt of glycyrrhizic acid extracted from licorice).

The research subjects were laboratory animals: Wistar rats weighing 120-190 g. and Chinchilla rabbits of both sexes weighing 2.0-2.5 kg.

Research methods: laboratory and biochemical. Examined was the state of indexes of cellular and humoral immunity in intact animals.

The experimental comparative study of the effect of «AZEOMED» and Glycyram pills on the immune system of animals was carried out in two ways:

1. Comparative study of the action of «AZEOMED» and Glycyram on the formation of the humoral immune response.
2. Using them when the immune response is malfunctioning.

During the study of comparative action of the «AZEOMED» and Glycyram preparations for antibody response (AR), boiled water was administered to the control group animals internally on daily basis, at the rate of 0.5 ml per 100 g of the animals' body weight per one administration for 20 days. The experimental animals were Wistar rats. On the 15th day, the rats were immunized intraperitoneally with sheep erythrocytes (SRBC) at a dose of 2×10^8 cells per 100 g. The animals were slaughtered by opening the jugular vein under ether anesthesia on the 5th day after the administration of antigen or, respectively, on the 20th day after the first injection of water. A similar scheme was used for experimental rats to which «AZEOMED» solution and Glycyram solution were administered internally. The «AZEOMED» and Glycyram medicinal preparation were injected by 0.05 per 100 g of the rats' body weight. SRBC immunization was performed 2 hours after the administration of the final dose of the preparation, followed by taking blood samples for analysis. The cell suspension was incubated for 4 hours in sterile siliconized tubes in № 199 medium (107 nucleated cells per 1 ml of the medium), with resuspending every 30 minutes. After the incubation, the cells were precipitated by centrifugation for 15 min at 1000 r/min. Supernatant fluid of spleen cells (SFSC) was prepared by mixing equal amounts of splenocyte incubate of 5-6 rats. In SFSC, the protein content was determined according to S.S.Shishkin (1982), then it was administered to the

intact animals once intraperitoneally in the amount containing 0.5 mg of protein per 100 g of body weight, simultaneously injecting them with SRBC. GID development degree was assessed by the number of cells in the spleen, which form antibodies (antibody forming cells, AFC), SRBC (N.K.Jerne, A.A.Nordin, 1963) and rosettes (rosette forming cells, RFC) with SRBC (J. Jondal et al., 1972). The results of establishing the AFC and RFC numbers were processed with variation statistics methods, arithmetic mean values and their confidence intervals were calculated with 95% probability (I.A.Oyvvin, 1960).

In the first round of experiments on studying the effect of «AZEOMED» and Glycyram preparations on immunological reactivity, it appeared that injection of the above-mentioned preparations stimulates AR formation, which was evidenced by the increased AFC and RFC number in the spleens of rats who were administered the preparation as compared with the control animals. «AZEOMED» and Glycyram displayed pronounced immunosuppressive effect as the AFC and RFC numbers in rats which were administered these preparations were considerably higher than in the animals of the control group. The AR indexes in rats which were administered «AZEOMED» were different from those in animals which were injected with boiled water.

Studies of the drug «AZEOMED», confirming its immunostimulating properties are also described in detail in /60-63/. We have provided an official opinion on the experimental and pharmacological justification for use with «AZEOMED» as an immunotropic agent. The prospects of the research we have done on studying the immunotropic properties of the Glycyram and «AZEOMED» preparations are apparent. The above-studied preparations can be obtained in enough quantity; the republic has raw stocks of natural zeolite, dolomite, siliceous ash as well as licorice root for that. The licorice preparations are harmless and have no side effect. The results obtained during the comparative studies of the pharmacological properties of «AZEOMED» and Glycyram (licorice root is used at the heart of this drug) have confirmed their high anti-inflammatory capacity coupled with immunostimulating activity.

We have obtained a patent for one of the modifications of the drug «AZEOMED» as an immuno-stimulating agent /127/. I have also received several dozen patents for drugs using licorice root.

Taking into account the successful experience of using licorice root in the prevention and treatment of coronavirus patients in Wuhan, China, I would like

to recommend the joint use of «AZEOMED» preparations in combination with a very effective licorice root product called “Biyān Broncho”.

In cases of diabetes mellitus, it is necessary to use licorice-based syrups with great care, it is advisable to consult a doctor first.

7.SORPTION ACTIVITY OF «AZEOMED» MINERAL COMPLEX AGAINST PATHOGENIC VIRUSES AND BACTERIA

by Prof. Dr. med. Farhanda Sadykhova

7.1. Poliomyelitis

The problem of poliomyelitis associated with the possibility of making wild poliovirus in the post-liquidation period, is a serious problem for health in general. Given the fact that in some states for some reason, still have the circulation of "wild" polioviruses in relation to the risk of skidding marked "wild" strains in a region free from po-lio, which applies to our republic, issue regular epidemiological monitoring of acute flaccid paralysis (AFP) remains valid.

In connection with the investigation to determine the spectrum of viruses circulating among the population and establish the etiology of acute flaccid paralysis in the Republic of continuing under the auspices of the World Health Organization (WHO).

Since 1977, functioning in Azerbaijan orderly system of epidemiological surveillance of AFP, provided for in the Programme of the Global Polio Eradication WHO.

In a distinguished program involving experts in various fields of specialization: virologists, neurologists, epidemiologists.

In order to improve the efficiency of isolation of entero-viruses from sewage with the least expenditure of time for indicating virus, we studied the adsorption capacity of zeolites Aydag domestic deposits /64/.

In the experience have been taken:

- Viral culture: the polio virus types 1, 3 (vaccine strains);
- Culture of transplantable cell lines L – 20 B (mouse embryo fibroblasts, derived from transgenic mice)

Studied the sorption properties of zeolites /64/:

1. mineral complex (MC) "«AZEOMED»". MC "AZEOMED" is derived from natural clinoptilolite Aydag field. The structure of the MC is activated zeolite species and further purified dolomite.

2. natural zeolites, modified with cations:

- Ag-clinoptilolite;
- Cu – clinoptilolite;
- Zn – clinoptilolite;
- NH₄ – clinoptilolite;

The experiment used conventional methods of virology studies /65, 66/. In the experience of zeolites were taken in 500 mg by identifying non-toxic dose (zeolite) in tissue culture, L – 20 B in the amount of 0.0005 mg / ml (the fifth non-toxic dose).

Identification of the sorption properties of natural zeo-lites, modified cations and MC "«AZEOMED»" on viral flora was layering 1 ml of virus-containing fluid in 100 TTSD50 (the dose of virus was determined by titration model of poliomyeli-tis virus (vaccine strain) in tissue culture L – 20 B) on the zeo-lite, taken in 500 mg.

After exposure at 2 o'clock in infected tissue culture su-pernatant fluid in the amount of 0,2 ml vial, incubated at 370S and sensitive for several days, the results of the cytopathogenic effect (CPP) of the virus, possibly left over after the "exhaus-tion" of the studied zeolites.

The results of the CPA to take into account the 4-cross system with a view taken in the experience of control: the model of viruses in 100 TTSD50 (10-3), tissue culture L – 20 B (mouse fibroblasts – genetically engineered by the line of mouse cells that have receptors for poliovirus).

Analysis of the results of the study revealed a high sorp-tion properties of all investigated zeolites on poliomyelitis vi-rus types 1,3.

This is due, apparently well-known fact that the most ac-tive is the adsorption of low molecular weight compounds. The molecular weight virion polio – 8h106-9h106, sedimenttation coefficient – 140 -165 S.

Experience of desorbed virus revealed a complete ab-sence of desorption from MK "«AZEOMED»", NH₄ – clinoptilo-lite, Ag-clinoptilolite, which indicates the possibility of using them for agregation viral flora and their removal from the body.

The fact of the desorption (100%) of viruses with Cu⁻, Zn – clinoptilolite, which can be used for display of enteroviruses from different waters, including waste water used in epi-demiological research.

Adsorption and desorption of poliomyelitis virus

Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010.

1, 3 types (vaccine strain) on the modified cations of clinoptilolite and tablets ««AZEOMED»».

Given we have identified high adsorption capacity of zeo-lites listed above were used as sorbents for the concentration of viral flora of viruses from wastewater for their display /67/.

It should be noted that the invention relates to display vi-ral flora in the effluent, namely the concentration of viruses on mineral sorbents.

A method of ultracentrifugation of viral flora of the large volumes of water /68/. The disadvantage of this method is the technical complexity for the general health practices.

A method of concentrating virus flora by ultrafiltration /69/.

The disadvantage of this method include the incomplete elution of viruses from the filter surface, the extreme fragility of lanthanum rapid clogging of filters and filter suspended particles, despite the pre-cleaning water.

The closest is the way to the concentration of viral flora – enteroviruses from slightly polluted water, drinking water, swimming pools with the use of ion exchange resins – anion exchangers, which are an inorganic or organic high molecular substances, containing active groups to easily exchange ions.

We know that many of the virions (intact viruses) are negatively charged particles and therefore can be adsorbed by anion exchangers strong-type /70/. The disadvantage of this method is the complexity of the pre-treatment of ion exchange resins before use. The complete elution runs for one hour, and ion-exchange resins can be used only once.

The proposed method we considered ways to simplify the concentration of viral flora, reducing the time of elution of the virus and its ability to re-use of mineral sorbent.

In our proposed method for concentrating viral flora of little duty water adsorption on clinoptilolite aluminosilicate sorbent followed by elution of the virus used as a sorbent modified cations Cu²⁺, Zn²⁺ at the same time, the

complete ad-sorption followed by elution of 30-45 minutes, which is much less when using the method of Riordan (from 3 to 7 days in a stream of water).

In addition, marked the sorbent can be reused, with the same activity.

The presence of cations Cu^{2+} , Zn^{2+} allows the extraction of viruses in the alleged conditions of up to 100%.

If you reduce the time of adsorption followed by elution not reached 100% as adsorption and elution, and the increase of time is impractical because the alleged enough for a complete adsorption and elution.

Method requests do not require prior activation of the mineral sorbent provides a high coefficient of concentration of viruses (1000 – 100000TTSD50) not only standing, but in flowing waters with 100% elution.

The method of concentration was tested on natural aluminosilicate sorbents – zeolites clinoptilolite breed Aydag origin, modified by cations Cu^{2+} , Zn^{2+} .

In carrying out monitoring of the circulation of enteroviruses, including polio virus among the population of Azerbaijan using 2 methods of concentrating virus to ensure that the wider range of enteroviruses studied wastewater.

Method of concentrating viruses from wastewater on the modified cations Cu^{2+} , Zn^{2+} zeolite (clinoptilolite) is quite acceptable for a wider surveillance to detect circulating among the population of viruses.

7.2. Adsorption properties of «AZEOMED» in relation to the viral-bacterial flora the malignant cell population

Unique adsorption and ion exchange properties, chemical and mechanical stability, high acidity, and radiation resistance of high-silicon zeolites causes their wide range of applications.

It was determined that the use of zeolites as therapeutic and preventive food additives gives a number of positive clinical effects.

Model experiments and clinical trials have revealed a strong anti-toxic effect of zeolites, and the unique characteristics of adsorption, ion exchange properties allow withdrawing heavy metals, free radicals, decomposition products and toxins from the internal environment.

Antitoxic, immunomodulatory, radioprotection and eliminating the dysbacteriosis actions are an indication for the use of zeolites in the treatment of

oncological diseases using radio-therapy, chemotherapy, antibiotic therapy, because they reduce the expression of negative side effects of these highly toxic therapies /71,72/. Later in the work /73/ was studied the adsorption of tumor cells in ovarian aminoorganomontmorillonite. The number of adsorbed cells was determined with derivato-graphic analysis. As it was determined the aminoorganomontmorillonite adsorbs a significant number of cells ($1.3389991 \cdot 10^{10}$).

Taken into account the above-mentioned, it was interesting to study experimentally the mechanism of depuration of decay products in the neoplastic transformation of tissues.

With this purpose were studied the adsorption capability of natural zeolite – clinoptilolite, modified in various ways and tablets "«AZEOMED»" /74/.

There were studied the adsorption-desorption capacities of a number of modified zeolites, including tablets ««AZEOMED»» relative to malignant cells on RD tissue culture models.

There were revealed the high adsorptive properties of the studied samples of zeolites, particularly the tablets ««AZEOMED»» and Ag-zeolite with the absence of desorption, which gives the reason to think about the possibility of using them as **sorbents of malignant cells** during the collapse of the tumor and their removal from the organism. To the adsorption of the malignant cell population on the zeolites, modified by various ways /75/.

The researches was to study the sorption capacity of the mineral complex (MC) ««AZEOMED»» on bacterial and viral flora. Mineral complex ««AZEOMED»» is derived from natural clinoptilolite Aydag field /76/. The structure of ««AZEOMED»» is the activated zeolite species and additionally purified dolomite.

In the experience have been taken:

- bacterial culture; E. coli; St.aureus, Candida albicans, Ps.aeruginosa;
- viral cultures;
- polio virus 1, 3 types (vaccine strains);
- culture of transplantable cell lines L-20B (mouse em-bryo fibroblasts, derived from transgenic mice);

There were studied the sorption properties of zeolites:

1. MC ««AZEOMED»»
2. Natural zeolites, modified with cations:
 - Ag – clinoptilolite;

- Cu – clinoptilolite;
- Zn – clinoptilolite;
- NH₄ – clinoptilolite;

In the experiment were used a conventional methods in bacteriology (6, 7, 8) and virology (9, 10, 11, 12).

In the experience of zeolites were taken in the amount of 500 mg on basis of the revealed non-toxic dose (zeolite) on tis-sue culture L-20B in the amount of 0.0005 mg/ml (5th non-toxic dose).

Experience in the identification of the sorption properties of zeolites on the above-mentioned bacteria was in layers of a certain dose (10⁻⁷) of the bacterial flora in the amount of 1 ml per zeolite with aging in 2 hours, then followed the seeding of the culture supernatant for elective medium and comparing the number of colonies after adsorption the control plating (bacte-rial turbidity standard on 2 billion in 1 ml of broth).

The calculation of results of the experience was carried out 24 hours after incubation at 37o C with the method of "counting of the colonies".

Results of the experiment revealed the following:

1. MC ««AZEOMED»» adsorbed St.aureus – 90%, Can-dida albicans – 80%, Pseudomonas aeruginosa – 90%, E. Coli – 70%
2. NH₄ – clinoptilolite – E. Coli – 50%, St.aureus – 90%, Candida albicans – 50%, Pseudomonas aeruginosa – 50%
3. Zn – clinoptilolite – E. Coli – 50%, St.aureus – 90%, Candida albicans – 80%, Pseudomonas aeruginosa – 50%
4. Ag – clinoptilolite – E. Coli – 70%, St.aureus – 90%, Candida albicans – 80%, Pseudomonas aeruginosa – 90%
5. Cu – clinoptilolite – E. Coli – 60%, St.aureus – 90%, Candida albicans – 80%, Pseudomonas aeruginosa – 90%

The relatively low adsorption capacity of the zeolites studied on E. Coli confirms existing research, indicating a weak adhesive properties of these bacteria.

Identification of the sorption properties of natural zeolites, modified with cations and MC ««AZEOMED»» on viral flora consisted of layers of 1 ml liquid in 100 virus-comprising TTSD50 (the dose of virus was determined by titration of model of poliomyelitis virus (vaccine strain) in tissue culture L-20B) on the zeolite in 500 mg.

After the exposure in 2 hours they infected the culture tissue with the supernatant fluid in the amount of 0,2 ml per bottle, incubated at 37°C and considered during several days the results of cytopathogenic action (CPA) of the virus, possibly remained after the “exhaustion” by the studied zeolites.

The results of the CPA were taken into account on the 4 + system with a view taken controls in the experience: the model viruses in 100 TTSD50 (10-3) and tissue culture L-20B (mouse fibroblasts – the method of genetic engineering, created lines of mouse cells that have receptors for poliovirus).

Analysis of the results of the study revealed the high sorption properties of all investigated zeolites on polio virus 1, 3 types (figure 1). This is due, apparently, the well-known fact that the most active is the adsorption of low molecular weight compounds. The molecular mass of the virion – $8 \times 10^6 - 9 \times 10^6$, sedimentation coefficient – 140-165 S.

Experience of desorbed virus revealed a complete absence of desorption from MC ««AZEOMED»», with NH_4 – clinoptilolite, with Ag – clinoptilolite, which indicates the possibility of their use for the aggregation of viral flora and their removal from the body.

There was determined the fact of desorption (100%) of viruses with Cu, Zn – zeolites, which can be used for display of enteroviruses from different waters, including waste water used in epidemiological research.

Summing up the received data, it is possible the application of combinations of zeolites with the revealed adsorption properties concerning bacterial and viral flora.

One of the urgent medical problems in the present is a violation of the normal flora of the intestine, which plays an important role in protecting the body against pathogenic microbes. Persistent violations of microbial coenoses are called dysbacteriosis (dysmicrobiocoenoses), among them, of course, the destruction of intestinal microflora predominate /77/.

It should be noted quite a wide range of indications for bacteriological diagnosis of intestinal dysbiosis: protracted infection and disorders for which can not be distinguished the pathogenic enterobacteria; protracted period of convalescence recovering from intestinal infection, gastrointestinal dysfunction on the background or after antibiotic therapy or in individuals, constantly in contact with anti-microbial drugs /78/.

Dysfunction of the gastrointestinal tract may also be in patients with diseases of malignant growth, suffering from dyspeptic disorders in patients being prepared for operations on the abdominal organs, as well as preterm birth or injured and in the presence of bacteremia and purulent processes are difficult to treat (ulcerative colitis and enterocolitis, pielity, cholecystitis, etc.).

Clinical studies show that the vast majority of patients with functional constipation marked imbalance of microflora of the colon, which is expressed mainly in reducing the number of bifidobacteria and lactobacilli and a higher than normal, con-tent conditionally – pathogenic enterobacteria and streptococci /79/.

There was established the presence of dysbiosis in pa-tients with constipation, but etiological and pathogenic interactions of microbial imbalance and motility of the colon was not studied enough.

To correct dysbacterioses there are recommended eubiotics – Coli-, lacto-, bifidobacterins and others /80/.

However, it should be noted the recent acquirement of special popularity of widespread use in various industries of the unique properties of zeolites. Involvement in the industrial production of new types of mineral raw materials is one of the most important economic tasks.

It largely applies to the problem of extending the spheres of natural sorbents application.

It should be noted that the need of different spheres of industry in zeolites increases continuously: high-silica natural zeolites are being increasingly used.

Among high silica natural zeolites the clinoptilolite occupies a special place – the most widespread in the sedimentary rocks of the zeolite, resistant to high temperatures and aggressive environments.

The possibilities of practical use of clinoptilolite is determined by its most valuable qualities – a specific ion-exchange capacity and the molecular-sieve properties.

Have appeared the researches on the use of zeolites as natural sorbents in medicine. There is a positive influence of complex dietary fiber, enterosorbents and dairy products, normalizing microecology large intestine /81,82/. Analysis of the data of Blokhina L.V. and Kochetkov A.M. revealed that at the initial stages of colon dysbacteriosis in patients with the syn-drome of functional constipation, the use of specialized dairy products (BIFIDOK), or dietary supplement "Litovit" to food, containing dietary fiber, enterosorbents or bacterial

complexes, has a positive effect. It was observed the suppression of growth of conditionally pathogenic microflora, as well as stimulating influence on the growth of symbiotic microbes – bifidobacterium, lactobacillus and escherichia coli. In most patients it was marked the elimination of large intestinal stasis and restoration of microbiological balance of the organism /83/.

Taking into account the given clinical observations on correcting disbacteriosis effect when using natural zeolite products, the confirmation of the received observations in the experiment, was of interest.

The purpose of this research was to study the adsorption capacity of the mineral complex «AZEOMED» on the bacterial flora in the model of pathogenic and nonpathogenic strains of colibacillus, E. Coli.

In the experiment were used the conventional bacteriological methods. Experience in the identification of the sorption properties of zeolites on the above-mentioned bacteria was in layers of a certain dose (in 10⁻⁷ – from 100 to 1000 col-onies) of bacterial flora (700-7000 IU) of pathogenic and non-pathogenic strains in the amounts of 1 ml per zeolite with exposure in two hours, followed by seeding of culture from supernatants on elective medium and comparing the number of colonies after adsorption on the studied zeolite – «AZEOMED» (1 tablet, 500 mg).

In bacteriology researches the degree of adsorption was determined by method of "counting the colonies" – comparing the number of colonies in control and the number of colonies after the adsorption of bacterial flora on zeolites.

It was determined a complete absence of colonies in Petri dishes with elective medium of bacteria E. Coli of pathogenic variant and conservation of sprout of colonies of nonpathogenic strains of E. Coli.

The received data were the confirmation of the received clinical observations a priori on the correction of dysbacteriosis in the application of natural adsorbents, in particular in the application as a sorbent of MC «AZEOMED».

Anthrax disease is a typical zoonosis caused by *Bacillus anthracis*, of Bacillacear family.

In natural conditions with anthrax are suffered primarily herbivores, mainly large and small cattle, horses, pigs, etc., in which the anthrax occurs, usually asymptomatic. But, it should be noted the well-known fact of human disease

anthrax, i.e. the fact of overcoming the causative agent of species-specific barrier with the manifestation of rather complex clinic of the disease.

Despite the relatively small percentage of the sickness rate of anthrax of people this infection being rather complex in the pathogenesis respect, it is quite a serious pathologies for humans.

Anthrax shows itself in three main clinical forms: cutaneous, pulmonary and intestinal. As a complication of any clinical form, and in debilitated and malnourished people can be developed the anthrax septicemia.

The task of the research is to identify the possible adsorption of capacity of domestic zeolite – natural sorbent on *Bacillus anthracis* – its spore and vegetative forms.

The applied enterosorbent is the basis clinoptilolite containing additional dolomite in the following ratio of components of mass %: clinoptilolite – 70-80; dolomite – 20-25.

As an antigen there was used STI vaccine, derived from non-capsular anthrax bacillus, which is a suspension of avirulent living spores of vaccine strains. (Anthrax live vaccine, lyophilisate for the preparation of a suspension for subcutaneous introduction and scarification application").

FSI Manufacturing, Central Research Institute of Ministry of health of defence of Russian Federation, Russia, Kirov, FSI, 48 Central Research Institute of the Russian Defense Ministry. (Anthrax live vaccine, 10 cutaneous or subcutaneous doses of 100 – 1 ml.)

Bacteriological studies were conducted by means of standard methods of bacteriology [84]. Taken in the experience of antigen was inoculated on Petri dishes with meat-peptone agar and in test tubes with meat-peptone broth.

In 1 ml of vaccine for cutaneous method there are 4 billion microbial cells, in the vaccine for subcutaneous use there are 100 million ones. The content of 1 ampule with 100 million microbial bodies was dissolved in 1 ml saline, inoculated in test tubes with meat-peptone broth. After 24 hours of incubation at 37°C from broth suspension the culture grown looped inoculated on Petri dishes with meat-peptone agar.

In the experience of adsorption of culture on the studied zeolite was taken the culture spore form of the antigen, i.e. from the ampule with the antigen, dissolved in 1 ml saline the experience was taken the dose of antigen in a dilution

of 1:200, i.e., in a dose of 0,5 million of microbial bodies, which gave 120 plaques on meat-peptone agar.

In the experience was taken a dose of zeolite in 400 mg. On the studied zeolite there was layered the bacteria-contatining fluid in the aforementioned doses; after 2 hours of adsorption the eluate was inoculated in Petri dishes with meat-peptone agar. At the same time the culture *Bacillus anthracis* was inoculated in the aforementioned doses as a control anti-gen.

As it was noted above, the selected doses of antigen gave 200 and 120 plaques on maet-peptone agar, respectively.

In the tested dishes with the inoculated eluate the anti-genic culture, i.e., *Bacillus anthracis* did not grow, i.e., there was observed the absence of plaques.

The received results indicate the revealed adsorptive opportunity of the studied sorbent, which can be used in the intestinal form of anthrax, and possibly in septicemia /84/.

Human cytomegalovirus (*Cytomegalovirus hominis*) was first singled out in 1956 from children who died of generalized infection. The virus affects the infants who become infected during the intrauterine development. Presumably the cytome-alovirus may persist for a long time in various human organs, as in healthy children, these cells are found in tonsil tissue, urine, and in the salivary glands /85/.

Most women of reproductive age are infected with cytomegalovirus. However, infection is generally latent.

Together with it cytomegalovirus (CMV) during pregnancy may be reactivated, such reactivated cytomegalovirus infection (CMVI) is usually asymptomatic, but in pregnant women it can lead to vertical transmission of the virus and consequently to miscarriages, premature births, anomalies of development and fetal death due to congenital malformations.

The above-mentioned deserves special attention and considers the necessity for examining the mentioned contingent of women on cytomegalic inclusion disease and at detection of active CMV infection they need treatment and preparation for the next pregnancy.

Is actual the task of reducing or even eliquidation the activity of CMV infection before planning pregnancy.

From this perspective, it was possible to study the natural adsorbents, in particular the natural zeolite – clinoptilolite as a sorbent of infected cells of the

infected person. It is known that the virus causes a characteristic cytopathic effect, consisting in the appearance of giant cells due to an increase of cytoplasm and nucleus.

In the cells there are intranuclear inclusions consisting of viral particles and nuclear chromatin, surrounded by a bright rim («Owl's eye»).

It should be noted that the virus persists in the body, particularly in the kidneys and is excreted with urine, saliva during many years.

The essence of the experiment is as following:

The cell suspension from the urine sediment was centrifuged at 2500 rpm for 30 minutes, and then the supernatant fluid (urine) was settled and poured off. The remaining cells in the sediment were diluted in nutrient medium MEM medium with a double set of amino acids and vitamins. The cell count was made in the Goryaev chamber. Having counted the number of cells in the received suspension, they were layered in quantities of 1 ml for the tested sorbent.

After contact for 30 minutes there were counted the cells in the eluate, i.e., were revealed the adsorption capacity of test sample of zeolite.

At the same time the examined pregnant women were examined for the presence of CMV infection by enzyme immunoassay – by method of Elisa.

The data received during Elisa and in setting the test «owl's eye» with counting of infected cells before and after adsorption of urine on the tested zeolite were analyzed in a comparative aspect.

It is interesting the question about possible desorption of cells from the surface of the test sample of zeolite after adsorption.

With this purpose to the zeolite with the settled cells was added the desorbent – physiological solution of 1 ml. and two hours after the contact there was counted the number of cells in the eluate desorbed from the surface of the tested zeolite under the influence of desorbent.

As a result there were revealed the high adsorption capacity of sample of the tested sorbent, i.e., ~ 100% adsorption of cells, absence of the factor of desorption of cells from zeolite is a positive factor.

Comparison of results of diagnosis of CMV by ELISA and the phenomenon of adsorption of infected cells revealed a logical combination of the deposited amount of desquamated cells, indicators of ELISA and the test «owl's eye».

The revealed adsorption opportunity of the studied of zeolite are supposed their recommendation for taking them as a food additive for the removal of infected cells from the body.

The factor of desorption is a positive moment in absolute detoxification of the body.

Yersiniosis (syn.: intestinal yersiniosis) is a disease of the group of zoophilous sapronoses caused by *Yersinia enterocolitica*. It is characterized mainly by the fecal-oral mechanism of transmission of the causative agent, intoxication, exanthema, lesion of the gastrointestinal tract and joints, susceptibility to protracted and chronic course and the formation of immunopathologic syndromes.

The special actuality of *Yersinia* infection is explained by not only spreading and increasing of disease, but also the serious problems of diagnosis, treatment and rehabilitation of patients. The particular anxiety cause by the adverse consequences of the having had yersiniosis, in particular chronization and systemic autoimmune processes.

Currently, for the treatment of *Yersinia* infections are used the broad-spectrum antibiotics. However, as it is known, the long-term use of antibiotics leads to polyresistance of many bacteria, in particular *Y. Enterocolitica*. In this regard, is actual the task of searching the palliative means of treatment, to which may be referred the enterosorbents.

The ideal enterosorbent must be non-toxic, non-traumatic for mucous membranes, with a good evacuation from the bowel, with a high sorption capacity in relation to the removed components of the chymus. As passing through the intestine the connected components should not be subjected to desorption, should not change the pH of the medium, to positively effect or not to influence on the processes of secretion and biocenosis of intestinal microflora.

From this point of view it was desirable to obtain the enterosorbent with wide range of action, both on the metabolic activity, and the bacterial flora.

In this regard, in the experiment was taken the enterosorbent on basis of zeolite-clinoptilolite, including additionally the dolomite in the following ratio of components of masses %: clinoptilolite – 70-80, dolomite – 20-30, with enterosorbent made in the form of tablet and for linking there is introduced the honey no more than 10% of the total mass [87]. Clinoptilolites are particularly

valuable kind of zeolites. They are widely spread in nature. Zeolite is a porous natural mineral containing up to 70% clinoptilolite, and as impurities: montmorillonite, quartz, feldspart, opal, volcanic glass, etc.

Natural zeolite in the gastrointestinal tract is not absorbed, do not get into the blood itself as crystal, and is in transit, interacting only at the level of selective ion exchange and selective sorption in contact with blood and lymphatic vessels of the intestinal wall, giving or taking the micro-, macroelements, catalysing the biochemical reactions.

Dolomite in the first content plays the role of the balancer between the gastric juice in the stomach of man and zeolite, which under the action of hydrochloric acid forms a soluble salt of calcium chloride and magnesium, thereby keeps the aluminosilicate skeleton of zeolite.

The essence of the solving task is in the spreading of assortment of enterosorbents relative to *Y. Enterocolitica*.

In the experience have been taken:

- Bacterial culture of *Y. Enterocolitica* (model: diagnostic erythrocyte enteric Yersinia antigen (09) for diagnostic purposes);
- Culture of transplantable cell lines L-20B (mouse embryo fibroblasts, derived from transgenic mice), used for identifying of non-toxic dose of the proposed enterosorbent based on zeolite-clinoptilolite and dolomite.

For the experiment was taken the enterosorbent of 500 mg on basis of the revealed non-toxic dose of preparation (zeolite + dolomite) on tissue culture L-20B in the amount of 0.0005 mg/ml (5th non-toxic dose).

For diagnosis of yersiniosis was applied macromethod setting of IHT (Indirect hemagglutination test) in polystyrene plates.

This method has been checked on the proposed enterosorbent.

On the surface of the tested enterosorbent (500 mg) was layered the dissolved in 10 ml 0.9% sodium chloride solution (1% suspension), erythrocyte diagnosticum.

15 minutes after the contact there was joined the dissolved antigen and the eluate after adsorption of the antigen with the titred control intestinal Yersinia serum 09 (1, 2 rows on the panel).

Thus was established the full adsorption of antigen on the proposed enterosorbent:

- **1 row** – positive hemagglutination (4+);
- **2 row** – complete absence of erythrocyte diagnosticum;

- **3 row** – additional control of the absence of antigen (negative hemagglutination);

More complete information on the study of «AZEOMED» as an antiviral and antibacterial drug is also given in /86-100 /.

Thus, in this part of our work, it is demonstrated that the «AZEOMED» mineral complex based on zeolite-clinoptilolite is a highly effective sorbent for many types of pathogenic viral and bacterial infections.

8.THE EXPERIENCE OF USING DRUGS BASED ON NATURAL ZEOLITE-CLINOPTILOLITE IN THE TREATMENT OF CANCER

В части 4 настоящей работы уже были описаны исследования и опыт работы Dr. Med. Ilse Triebnig для лечения онкологических больных /44/. Мы также хотели бы привести результаты исследований препарата АЗЕОМЕД, которые были проведены Субботиной Е /101/. Принимая во внимание необходимость детального и точного описания этих исследований мы решили полностью привести авторский текст приведенный в работе /101/.

«Case 1. Patient K.Elbrus, 1957

The diagnosis: Peripheral бластома in the bottom share of the right lung. Т3NX MTS hepar. IV st. IV clinical group.

In view of neglect of process symptomatic treatment was spent only.

Complaints: respiration 20 in a minute; pains in the right 1/2 of a thorax, limfostasis in the right top extremity, strong general weakness, absence of appetite.

The general analysis of blood:

- HB – 50 g/l
- leykoc – $4,9 \cdot 10^9$ /l
- Eritros – $3,8 \cdot 10^{12}$ /l
- ESR – 48 mm/h

««AZEOMED»» have been prescribed to the patient 2 times a day 2 capsules. Within a week there has come subjective improvement at the patient – there was an appetite, pains in a breast have decreased, the general weakness has decreased, ESR has gone down to 34 mm/h, the respiration rate has decreased to 18 per minute.

The patient has accepted 1 packing «Azeomed» on a course with positive subjective and some objective dynamics.

Case 2. Patient I.Egor, 1937.

The diagnosis: a cancer of duodenum MTS in a liver. IV cl. gr. IV stage.

Complaints: severe pains in the field of a navel and right hypochondrium, absence of appetite, sharp general weakness. The patient accepts narcotic analgetic.

AIAT and AsAT more than in 2 times exceeded norm.

It is appointed «Azeomed» 2 t. × 3 times a day after meal.

After 9 days the pain have decreased, the dose of narcotic managed to be reduced to 50% (Promedol from 4 to 2 am-poules in day), with additions of non-narcotic preparations (Baralgin 1 ampoule 2 times a day). The general weakness has decreased. AIAt and AsAt have decreased on 25%. After the

Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010.

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course termination considerable improvement of the general condition was marked approximately within a month. For ex-ample – patient which could not get up independently, has started to cook food. Up to death of the patient increase of a dose of a drug was not required.

Case 3. G.Ellada, (23.06.07) 1966 of a birth.

The diagnosis: fibroadenomatosis of both mammary glands. A condition after 2 sectoral resections of mammary glands (2003)

Complaints: pains in both mammary glands, presence of small formations in both mammary glands, undue fatigability.

Ultrasound investigation of both mammary glands:

«A condition after a sectoral resection (2 parties), fibrosis – cystosis mastopathy (number of cystis 7-10, the size to 1,3 sm». Thyroid gland hormones – norm. Data of gynecologic ul-trasonic: a uterus Fibromatosis.

The patient accepted «Azeomed» 2 t. × 2 times a day on a course 1 packing.

The size of cysts has decreased to 0,7 sm the greatest (45%). Pains in mammary glands became significantly rarer. The patient marks improvement of the general condition. Pal-pation shows the reduction of the fibrous centres, mammary glands soft, painless was marked.

Taking into consideration a small amount of patients. I wish to underline, that at the minimum duration of treatment with «Azeomed» has shown appreciable clinical activity, especially considering severity of pathology.

At all patients considerable subjective improvement was marked. As in palliative therapy improvement of quality of a life and removal of a tumoral intoxication plays a main role, it is possible to tell, that «Azeomed» will be actual at oncological patients in quality of detoxic the agent.» /101/.

Между тем ряд исследователей также получили хорошие результаты в процессе профилактики и лечения онкологических больных /102-107/.

Одним из первых патентов был получен Harley Kaufman. (Epithelial cell cancer drug. Patent USA № US 6,288,045 B1, Sep.11.2001) /124 /. В данном патенте предлагается применять природный цеолит-клиноптилолит путем его принятия внутрь пациентом. В патенте указывается, что природный цеолит уничтожает epithelial cell cancer.

В работе /102, 103, 104/ описано проведение экспериментов на различных культурах опухолевых клеток и животных со злокачественными опухолями. Лечение больных раком мышей и собак с помощью цеолита-клиноптилолита приводило к улучшению общего состояния их здоровья, увеличению продолжительности жизни, а в некоторых случаях к уменьшению опухоли. Powdered of natural zeolite reduced the metabolic rate of cancer cells and increased binding of HNE to albumin in vitro. It selectively reduced generation of HNE in vivo in tumor stroma after Doxorubicin treatment leaving onset of lipid peroxidation intact in malignant cells. Combined treatment with Doxorubicin and natural zeolite resulted in strong reduction of the pulmonary metastasis count increasing anticancer effects of Doxorubicin.

В работе /105/ two different structures of zeolites, faujasite (FAU) and Linde type A (LTA), were studied to investigate their suitability for drug delivery systems (DDS). The zeolites in the sodium form (NaY and NaA) were used as hosts for encapsulation of alpha-cyano-4-hydroxycinnamic acid (CHC). CHC, an experimental anticancer drug, was encapsulated in both zeolites by diffusion in liquid phase. “Both zeolites alone revealed no toxicity to HCT-15 cancer cells. Importantly, CHC@zeolite exhibit an inhibition of cell viability up to 585-fold, when compared to the non-encapsulated drug. These results indicate the potential of the zeolites for drug loading and delivery into cancer cells to induce cell death” /105/.

В работе /106/ the synthesized zeolite frameworks are proposed to be of strong potential drug delivery vehicle for the treatment of gastrointestinal cancer.

Thus, it can be stated that the use of the mineral composition «AZEOMED» and some other drugs based on natural zeolite-clinoptilolite together with standard cancer therapy can significantly increase the effectiveness of treatment of cancer patients.

9. RESULTS OF BASIC CLINICAL AND LABORATORY TESTS OF THE «AZEOMED» MINERAL COMPLEX

These clinical studies were conducted by a physician E.A. Hismatova /88,89/. Given the great importance of these clinical studies for testing the effectiveness of the mineral composition «AZEOMED», we cite them fully in the author's text.

«The aim of clinical trial of ««AZEOMED»», which includes natural silica and dolomite, was to study its influence on the condition of health of patients. To the investigation were involved 29 patients of different sex and age group. Before the experiment from all patients was collected the anamnesis, was carried out the survey of complaints, laboratory analysis of blood and urine, EEG, and computer diagnostics on the program "AMSAT". The repeated surveys were carried out 4 and 6 weeks later. Most patients took ««AZEOMED»» one tablet 2 times a day during one to three months. Daily dosage of taking of ««AZEOMED»» was determined by the condition of health and age of the patient.

All examined were divided into 3 groups:

- I group (11 people), taking one tablet 2 times a day before meals;
- II group (9 people) – 2 tablets 2 times a day;
- Control group (9 people);

The results of researches showed the positive dynamics in clinical symptomatology, functional diagnostics and in laboratory analysis of blood and urine of the examined people.

The positive dynamics in analysis of blood of experimental groups concerned mainly the hemoglobin, and other blood parameters, i.e. quantity of leukocytes and ESR during all period of examining were within normal limits. 4

weeks af-ter taking the ««AZEOMED»» the hemoglobin of patients with low levels was rising to normal and of patients with normal hemoglobin – it was rising to the upper limit of the norm. And 6 weeks later it remained stable on the upper limits of the norm. The same positive dynamics was observed in analysis of urine too. In the analysis of urine of the half of the tested pa-tients were found the leukocytes and erythrocytes in a large number. Epithelial cells and salt, i.e. elements of pyelocystitis and urine acid diathesis. 4 weeks after taking the ««AZEOMED»» there was noted the improvement of indicators of the urine of patients to an average level of norm, and 6 weeks later these indicators reached the upper limit of the norm.

Besides the patients undergoing the clinical trial, we had volunteers who wanted to participate in clinical experi-ment. As a result of the survey 54 of 62 patients noted the posi-tive, and some of them – even the significant effect of taking the ««AZEOMED»» and 8 of them did not note any changes in feeling. The survey revealed the following:

- 1) Almost all patients noted the improvement of general well-being and improving the functions of individual organs and systems;
- 2) Was noted a significant decrease of incidence of gen-eral cold diseases;
- 3) In the rubbing of the drug in the gingiva or its chew-ing, the symptoms of periodontitis have passed;
- 4) And finally, the patients felt the tangible effect on the skin, hair and nails, videlicet the spots, papilloma was de-creased and disappeared, and reduced the falling and fragility of the hair, layering of nails.

Based on clinical trials of the «AZEOMED» mineral complex, we have drawn the following conclusions:

The results of examining the patients and a questionnaire for clinical trial of mineral composition ««AZEOMED»» re-vealed the following:

- 1) Almost all patients noted the improvement of overall health, increasing of physical and mental capacity, a decrease of weakness, tiredness.
- 2) Was significantly decreased the incidence of cold deseases.
- 3) Was noted the improvement of functions of the gastro-intestinal tract, namely: increasing of appetite, weight gain in the body (in the case of taking the drug before meals), decreas-ing the dyspeptic actions – heartburn, belching, bloating, im-proving the bowel function, in particular, the normalization of stool.

- 4) Was improved the function of urinary system, evi-dence that the results of laboratory tests of urine from the sub-jects. In particular, by the end of the 4th week of studies the urine indicators of patients were improving to an average level of norm, and by the end of the 6th week – fully corresponded the norm.
- 5) There was a positive dynamics in the blood of patients with regard to hemoglobin, namely in patients with low hemo-globin level it rose to the norm, and in patients with normal hemoglobin, it rose to the upper limit of the norm.
- 6) The majority of patients had a positive dynamics in diseases of the musculoskeletal system: decreased the pain in the spine and joints, numbness and a feeling of heaviness in the legs.
- 7) About the central nervous system the patients noted the reduction of depression, irritability, decreasing of head-aches.
- 8) Improved the functions of the cardiovascular system: normalized the blood pressure, decreased the pain and heavi-ness in the heart.
- 9) When rubbing the drug in the gingiva or its chewing, the symptoms of periodontitis have passed.
- 10) And finally, there was a decrease of skin rashes, pap-illoma, layering and brittleness of nails, and an increase of growth and strengthening of hair.”

10. PROSPECTS FOR APPLICATION OF THE “«AZEOMED»” MINERAL COMPLEX TO REDUCE THE RISK OF INFECTION AND MORTALITY FROM COVID-19

As we have already noted in this paper, the dynamics of the development of the COVID-19 epidemic in different countries is completely different. In China, it was possible to almost completely stop the development of the epidemic within 3.5 months from the date of official registration of the first person infected with coronavirus.

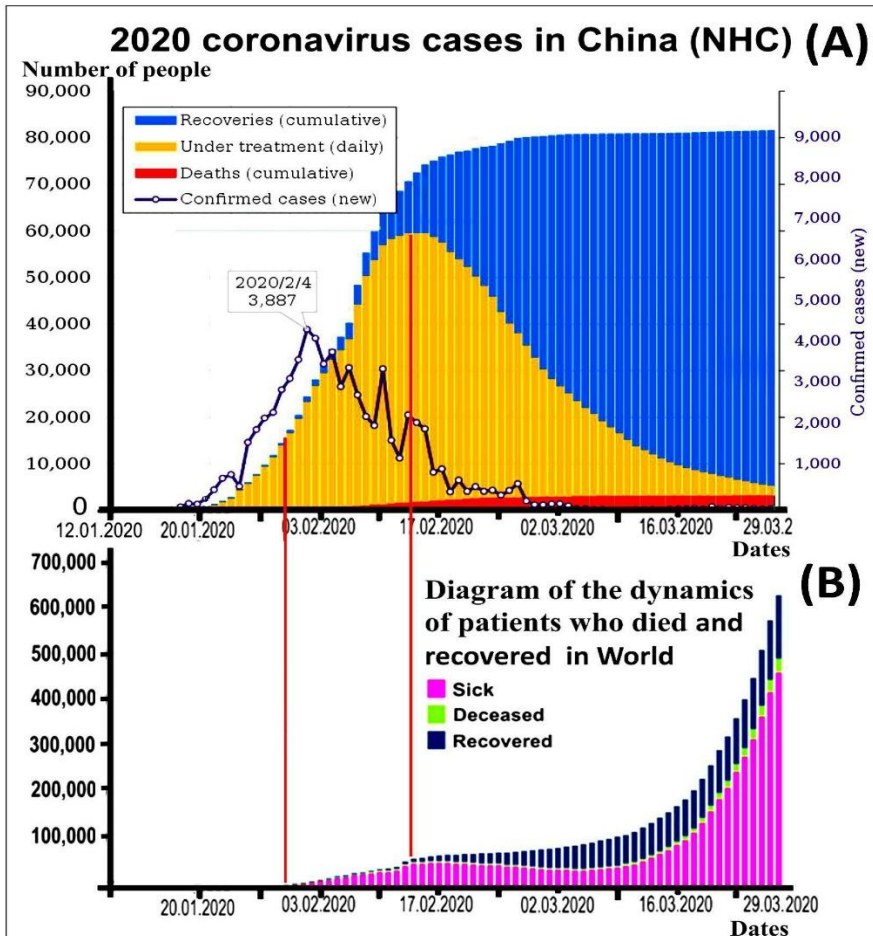


Figure 14: Comparison of the dynamics of statistical data of patients under treatment and deceased, as well as those who recovered from coronavirus in China (A) and in the world (B). The data for the world is taken from / 2 /, the data for China is taken from / 120 /.

If we look at a graph comparing the development of the COVID-19 epidemic in China and in the world in Fig. 14, a very pessimistic conclusion suggests itself. With such a development of the situation, one can expect the number of deaths in the world from 2.5 to 10 million people until the end of 2020.

To more clearly demonstrate the difference in the dynamics of the development of the COVID-19 pandemic in China and in the world, we present Table 6. Table 6 shows the percentage of sick, dead and recovered in relation to the total world population and the total population in China on March 29, 2020.

Table 6. The percentage of sick, dead and recovered in relation to the total population of the world and China

Region	Total population	% of the number of patients with COVID-19	% number of dead	% of recovered
World	7 731 626 626	0,0084%	0,00039%	0,0018%
China	1 424 548 267	0,0058%	0,00024%	0,0053%

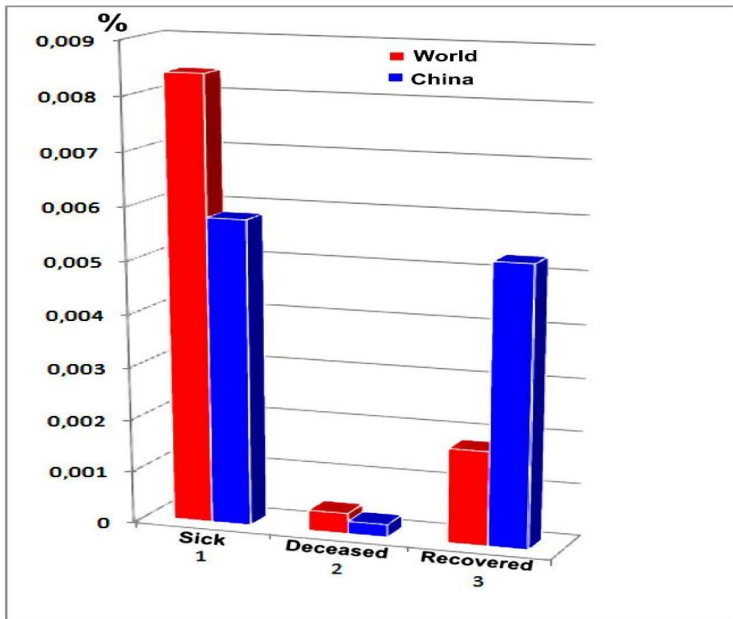


Figure 15: Comparison of graphs of the percentage of patients dead and recovered in relation to the general population world (shown in red) and China (shown in blue).

As in Table 2, and in Fig.15. one can clearly observe, by the percentage of the number of patients with COVID-19 who died and recovered from the general population, in China all indicators are significantly lower than similar indicators for the world. At the same time, it must be borne in mind that in China the epidemic is almost completely stopped, while the world's population is only at the initial stage of the epidemic. The world community does not have time for “buildup”, the situation is quickly getting out of control. If we can understand the reasons for this difference in the

dynamics of the disease and mortality in the World and China, we may still manage to avoid the worst-case scenario of the planetary development of the pandemic.

Our analysis of scientific publications, data from official Chinese medical sources and information on the Internet / 1-9,11,89,90,120-122 /, we identified the main reasons for the quick and effective elimination of the COVID-19 epidemic:

1. The introduction of strict quarantine and isolation of the population of the infected regions of China from other regions;
2. The adoption of tough measures against citizens violating quarantine and achieving a high level of quarantine discipline;
3. Compliance with the population of China the necessary sanitary and hygienic rules developed by the World Health Organization and the State structures of China;
4. The adoption by the Government of China of emergency measures and the concentration of all scientific, technical, financial and human resources to combat the epidemic, including:
 - urgent construction of 16 temporary hospitals in Wuhan, Hubei province, where 12 thousand patients with coronavirus were treated from the moment of their opening until their closure;
 - attraction of resources of many ministries and departments, including the army;
 - quick re-equipment of enterprises for the production of sanitary protection products - protective masks and glasses, special clothing, disinfectants, etc.;
 - in the short term, ensuring round-the-clock supply by the state of shops and supermarkets with food, and pharmacies with necessary medicines and hygiene, disinfection and sanitary protection;
 - absolutely free treatment of all patients with coronavirus and quarantined in medical institutions;
 - quick analysis of statistical and medical data and identification of types of chronic diseases in which there is a maximum risk of infection and death;
 - identification of the dependence of the risk of morbidity and mortality depending on the age of people;

- widespread use of Chinese traditional medicine (CTM) for the treatment of patients with coronavirus;
- successful integrated use of already produced antibiotics and antiviral drugs with CTM drugs, as well as vitamins and bioactive additives that increase the body's immunity and resistance.

Thus, as we see, the people of China were the first to take the unexpected blow of the COVID-19 epidemic and did not have enough time to prepare for this emergency. Nevertheless, after the first slight confusion, China quickly mobilized and confidently took control of the process of limiting the development of the epidemic.

Today, unlike China, the world has unique medical, sanitary and statistical information using Chinese experience and knowledge. We know how the epidemic is going and we have a successful example of its elimination in China.

A natural question arises: Why, having unique experience and knowledge that China did not have, we cannot effectively act and quickly defeat the pandemic?

Let's try to figure it out.

Chinese doctors identified age groups at risk for coronavirus infection, so age is one of the main criteria for morbidity and mortality.

Dependence of COVID-19 infection risk and mortality on age.

Table 7.

Age, years	The probability of infection with coronavirus in%	Chance of death % of coronavirus
0-9	0,01	0,001
10-19	0,1	0,005
20-29	1	0,009
30-39	3,4	0,02
40-49	4,3	0,5
50-59	8,2	0,6
60-69	11,8	1,8
70-79	16,4	4,3
≥80	18,4	7,8

The second important criterion for the risk of mortality, which was established by Chinese doctors, is the dependence of mortality on the type of chronic disease that a patient with coronavirus has. These data are shown in Table 7.

Unfortunately, if we take into account both criteria, we can say that with increasing age, the risk of the second criterion also increases at the same time. That is, in elderly people and old people, several chronic diseases are usually observed simultaneously, most often related cardiovascular diseases and hypertension.

**Dependence of mortality COVID-19
categories from chronic diseases. Table 8.**

Type of chronic disease	Chance of death% of coronavirus
The cardiovascular system	13,2%
Diabetes	9,2%
Hypertension	8,4%
Respiratory diseases	8%
Cancer	7,6%

What, first of all, did Chinese physicians do to increase the chance of recovery of patients with coronavirus and reduce their mortality?

Taking into account that there was no vaccine against coronavirus and its mass production and use is not expected in the during minimum one year, Chinese doctors began to intensively carry out preventive treatment of chronic diseases of patients and supplied them with Chinese traditional medicine based on medicinal plants and various biological components, widely using for this bioactive nutritional supplement. Thus, they maximally strengthened the body's immunity and resistance, both in relation to chronic diseases and in relation to COVID-19.

We would also like to mention a number of important works that describe clinical and laboratory studies of the mineral composition «AZEOMED» / 109-114, 117-119 /. Based on the results of studies on the use of natural zeolite-clinoptilolite in medicine, we obtained patents cited in / 124-134 /.

In this work, we showed that the «AZEOMED» mineral complex is highly effective for treating all groups of patients identified by Chinese doctors as patients with the highest risk of COVID-19 infection and mortality.

CONCLUSION

- The drug «AZEOMED» has shown good efficacy in complex treatment, along with standard therapy, of diseases of a high risk of mortality for patients with coronavirus, such as: cardiovascular system; diabetes; hypertension; Airways; cancer. In addition, studies have shown it is also effective in the treatment of pulmonary tuberculosis, HIV, respiratory diseases and other dangerous diseases.
- The high adsorption capacity of «AZEOMED» against many pathogenic viruses and bacteria suggests that it can also exhibit high antiviral activity against coronavirus, which requires additional laboratory studies.
- As noted, zeolite adsorbs toxins secreted by pathogenic viruses and bacteria, which destructively affect all functional systems of the body, including the immune system. Due to the detoxification of the body by zeolite, the immune system and the functionality of cells and all organs are restored.
- In the studies of Chinese scientists, it was noted that due to lung damage due to coronavirus, the body experiences a severe lack of oxygen, both in the blood and at the cellular level. Therefore, Chinese doctors, along with the use of artificial respiration apparatus and oxygen pads, enriched water with oxygen and gave it to patients to drink.
- In the course of clinical studies of the drug «AZEOMED», it was proved that zeolite is a supplier of oxygen to the human body when taken orally. In the stomach, the desorption of oxygen located in the pores of the zeolite occurs, which leads to additional saturation of the human body and blood with oxygen. This helps people more easily endure oxygen starvation. This conclusion was made by studies conducted with volunteers in a pressure chamber with a low oxygen content. Those subjects who took «AZEOMED» had much better and longer tolerated oxygen starvation, compared with those who did not take «AZEOMED» / 107 /.
- In any case, the use of the mineral composition «AZEOMED», as well as other proven preparations (BAA) based on natural zeolite-clinoptilolite, we recommend for the prevention and treatment of COVID-19.
- We would especially like to emphasize that most of the clinical and laboratory studies of the drug «AZEOMED» were coordinated and funded by the International Scientific and Technical Complex Intergeo-Tetis, the scientific management of the work was carried out by the Azerbaijan Section of the International Academy of Sciences H&E (Baku, Azerbaijan).

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WHAT ANALOGUES OF THE MINERAL COMPOSITION "AZEOMED" EXIST IN THE WORLD AND WHERE CAN I BUY THEM?

№ №	Title	URL link
1	Vita Med	https://www.detoxprotocols.com/product/zeolite/
2	Zeo3act-H	https://europeanpharmacyonline.com/product/pure-natural-ultra-fine-zeolite-powder-100g/
3	Megamin Activ	http://www.megamin-activ.com/en
4	Panaceo Med	https://www.panaceo-shop.com/produkt-kategorie/panaceo-med/
5	Zeolite Pure	https://www.amazon.com/Health-Zeolite-Natural-Mineral-Supplement/dp/B01N2NK7UM
6	Zeo Medic	http://zeomedicine.com/
7	Litovit	http://argo-pro.ru/products/litovit
8	Zeo Effect Detox	https://sinoplasan.de/Ingredients/Zeolite
9	ZeoOne	https://www.natresearch-zeolite.com/products
10	Zeolite Clinoptilolite	https://www.ec21.com/product-details/Zeolite-Clinoptilolite--8797556.html
11	Zeolite Clinoptilolite Natural Mineral Detox	https://www.ebay.com/itm/Zeolite-Clinoptilolite-Natural-Mineral-Detox-Effective-Gut-And-Immune-System/283855187405?hash=item4217166dcd:g:w~8AAOSwqkxen0j4
12	Smile Zeolite	https://www.athenstrainers.gr/en/blog/smile-zeolite-150-caps/

REFERENCES

1. Wen-Bin Yu, Guang-Da Tang, Li Zhang, Richard T., Corlett. Decoding the evolution and transmissions of the novel pneumonia coronavirus (SARS-CoV-2) using whole genomic data. chinaXiv:202002.00033v2.
2. Worldometer. COVID-19 CORONAVIRUS PANDEMIC.
<https://www.worldometers.info/coronavirus/>
3. Cui J, Li F, Shi Z-L. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol* 2019; **17**(3): 181-92.
4. Gorbalenya AE, Baker SC, Baric RS, et al. *Severe acute respiratory syndrome-related coronavirus: The species and its viruses –a statement of the Coronavirus Study Group*. 2020: 2020.02.07.937862.
5. Zhou P, Yang X-L, Wang X-G, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature* 2020; doi: 10.1038/s41586-020-2012-7.
6. Чжу Н., Чжан Д., Ван В. и др. Новый коронавирус от пациентов с пневмонией в Китае, 2019. *N Engl J Med* 2020: 10.1056 / NEJMoa2001017.
7. Li Q, Guan X, Wu P и др. Ранняя динамика передачи в Ухане, Китай, новой коронавирусной пневмонии. *N Engl J Med* 2020: 10.1056 / NEJMoa2001316.
8. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020; published online March 9.
[http://dx.doi.org/10.1016/S0140-6736\(20\)30566-3](http://dx.doi.org/10.1016/S0140-6736(20)30566-3).
9. Chinese Center for Disease Control and Prevention. COVID19.
<http://www.chinacdc.cn/en/COVID19/>
10. Where is the world at with a coronavirus vaccine?
<https://www.wired.co.uk/article/coronavirus-vaccine-trials>
11. Coronavirus disease 2019
https://en.wikipedia.org/wiki/Coronavirus_disease_2019
12. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. *Proceedings*. SWB. Baku-London, 2010. – 164 pp.
13. Natural zeolite in medicine. Edited by Khalilova T.Sh. SWB. Bourgas, 2010, 284 p.
14. Chinese researchers have created a mouse model for the selection of TCM drugs for the treatment of COVID-19. RUSSIAN.NEWS.CN.
http://russian.news.cn/2020-03/29/c_138927663.htm
15. Novosyolova T.I. “Preclinical and clinical studies of “LITOVIT” biologically active food supplement (bafs)”. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. *Proceedings*. SWB. Baku-London, 2010, pp. 59-72.

16. Panichev A.M., Kulakov Yu.V., Gulkov A.N. Use of zeolites in medicine. *Pacific Medical Journal*, 2003, No. 4, p. 21-24.
17. Morphological and functional impact assessment of a highly active Litovit supplement on organs and body systems / Borodin Yu.I., Gorchakov V.N., Bqatova N.P. et al., Novosibirsk: Ekor, 2000.
18. Khalilov E.N., Bagirov R.A. Natural zeolites, their properties, production and use. Baku-Berlin, Elm, ICSD/IAS, 2002, 350 p.
19. Khalilov E.N., Khalilova T.Sh. Perspectives of creation of zeolite industry in Azerbaijan. Sofia zeolite meeting 95 International Symposium and Exhibition on Natural Zeolites. Abstract, Sofia, Bulgaria, June 18-25, 1995.
20. Kervran C.L. (1989): *Biologische Transmutation*. Autorisierte Übersetzung des englischen Werks (Deutsch von Helmut Lasarczyk). Nach der englischen Version von Michel Abehsera. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p.43.
21. Kuklinski B. (2008): Praxisrelevanz des nitrosativen Stresses. 1. Mitteilung Diagnostik und Therapie neurologischer Erkrankungen. *OM u. Ernährung* 124, p. F2-21. 2. Mitteilung: Therapie internistischer Erkrankungen. *OK u. Ernährung* 125, p. F16-32.
22. Heilmyer, P. (2008): Die LOGI-Methode. *Ernährung und Medizin* 23, p. 20-25.
23. Shalmina G.G.; Novoselov YaB. (2002): Sicherheit der Lebenstätigkeit. Ökologisch-geochemische und ökologischbiochemische Grundlagen. Novosibirsk, p. 1-433 (russisch) Blzonacmost shiznedeyatelnosti ekologo-geokhimičeskie i ekologo-biokhemiteskije osnovy.
24. Anke, M.; S. Szentmihalyi (1986): Prinzipien der Spurenelementversorgung und des Spurenelementstoffwechsels beim Wiederkäuer. In: M. Anke; Chr. Brückner; H. Gürtler; M. Grün: Arbeitstagung Mengen- und Spurenelemente. Leipzig, p. 87-107.
25. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p. 44
26. Avzyn, A. P.; V.A. Shakhlamov; M. A. Rish; L. S. Stročkova (1991): *Mikroelementosen des Menschen*. Medicina, Moskau, p. 1-496.
27. Mayanskaya, N.N.; Ya. B. Novoselov (2000): Sanogenetische Prinzipien von Mitteln, die auf der Grundlage von Naturineralien hergestellt worden sind (russisch). Ekor, Novosibirsk, p. 1-85. Sanogenetičeskie prinzipy Bozdeystviya na organizm srestv na osnove prirodnykh mineralov.
28. Enslinger (1986): In: Shalmina, G. G.; Ya B. Novoselov (2002): Sicherheit der Lebenstätigkeit. Ökologisch-geochemische und ökologisch-biochemische Grundlagen. Novosibirsk, p. 1-433

29. Sevan-Schreiber D. (2008): Das Antikrebsbuch. Verlag Antje Kunstmann, München.
30. Voronkov M.G.; Zelchan G.L.; Lukevitz E. (1975): Silizium und Leben. Akademie-Verlag, Berlin. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p. 45.
31. Blagitko E.M.; Yashina F.T. (2000): Prophylaktische und therapeutische Eigenschaften des Naturzeoliths. Ekor, Novosibirsk, p.1-158 (russisch) ISBN 5-85618-115-8.
32. Agronomov, A.E.; Patrikeev B.B.; Rudenko A.P. (1958): Vestnik MGU (ser. Mal, Mex., Fiz., Khim) No 3, p. 197. In: M. G. Voronkov; G. L. Zelchan; E. Lukevitz (1975): *Silizium und Leben*. Akademie-Verlag, Berlin.
33. Patrikeev B. B. (1958): Spezifičeskoe formovanie povcikhnosleyi katalitičeskiye prozessy. Doctoral dissertation MGU, Moskau
34. Becket, A. H.; P. J. Anderson (1960): In: Voronkov, M. G.; G. L. Zelchan; E. Lukevitz (1975): *Silizium und Leben*. Akademie-Verlag, Berlin, p. 12-52.
35. Haldeman, R.G.; Emmett P.H. (1955): J. Phys. Chem. 59, p. 1039.
36. Yakimov A.V. (1998): Wissenschaftliche Begründung und Perspektiven der Anwendung der Zeolith-enthaltenden Ergänzungen in der Viehzucht. Dissertation, Rasan. Russische Akademie der landwirtschaftlichen Wissenschaften. Wissenschaftliche Produktionsvereinigung „Niva Tatarstana“.
37. Yakovlev V.V. (1990): Der Bedarf an Silizium bei der Aufzucht von landwirtschaftlichen Jungtieren. Dissertation Universität Saransk, Russland, p.1-21
38. Volcani B.E. (1986): Diskussionsbeitrag Ciba Foundation Symposium 121: Silicon biochemistry. John Wiley u. Sons, Chichester, New York, Sydney Toronto, Singapore, p. 110.
39. Cairns-Smith A.G. (1985): Bestanden die ersten Lebensformen aus Ton? Spektrum der Wissenschaft 8, p. 82-91.
40. Oschilewski U.; Kiesel U.; Kolb H. (1985): Administration of silica prevents diabetes in BB-rats. Diabetes 34, p. 197-199.
41. Nikolajev W.; Mayanskiy D. (1997): Zur Effektivität der neuen Nahrungsergänzungsmittel. Sibirische Gesundheit heute 6, p. 1-3.
42. Gorokhov W.K.; Duničev V.M.; Melnikov O.A. (1982): Zeolithe aus Sakhalin. Vladivostok, Dalnevostočnoe Knishnoe izdatelstvo, p. 1-105.
43. Daskaloff N. (2005): froximun: Verhalten von isotope-markiertem aktiviertem Klinoptilolith-Zeolith während des Durchgangs im Verdauungstrakt. Auszüge vorliegender Forschungsergebnisse, November 2006, p. 41-42.
44. Ilse Triebnig, Ingomar W. Schwelz. Der Stein des Lebens. Vien/Dunaj, 2012, 214 p.

45. Ilyicheva T.N., Zaikovskaya A.V., Shestopalov A.M. Evaluation of antiviral activity of «AZEOMED» preparation. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.69-74.
46. Report on the results of the joint activity of the State Scientific Research Center of Virology and Biotechnology "Vektor" and Yeni Tex LLC of the Azerbaijan Republic for 2008-2009 Koltsovo, Novosibirsk Region, Russian Federation, 2009.
47. Agayev F.F., Musaev A.U., Alhasova A.V., Mamedov I.A., Aliyev R. Use of the drug "«AZEOMED»" in complex treatment of pulmonary tuberculosis. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. *Proceedings*. SWB. Baku-London, 2010, p. 149-150.
48. Rahimova A., Omarova Z., Agamaliyeva A., Javadova G., Kerimova G., Javanshirova L., Khalilova T. Complex using of «AZEOMED» for candidamycosis in HIV – infection. Transaction of the National Research Institute of Medical Prophylaxis Named after V. Akhundov of Ministry of Health of Azerbaijan. Volume III, Baku, 2010, p. 96-102.
49. Application of natural zeolites in cardiology. Series: Cardiology. (Under the editorship of T.Sh. Khalilova), SWB, London-Baku, 2012, 34 p.
50. A.V. Yakovlev. Methods of correction of antioxidant protection in patients with coronary heart disease in elderly and old age. Application of natural zeolites in cardiology. Series: Cardiology. (Under the editorship of T.Sh. Khalilova), SWB, London-Baku, 2012, p.31.
51. N.G. Mezentseva. Litovit in cardiology. Application of natural zeolites in cardiology. Series: Cardiology. (Under the editorship of T.Sh. Khalilova), SWB, London-Baku, 2012, p. 28-30.
52. Panin L. E., Aizman R. I., Gerasev A. D., Lukanina S. N., Koroshchenko G. A. Drug for the treatment of diabetes. Patent No. 2329813 of the Russian Federation, Patentee: Research Institute of Biochemistry, Siberian Branch of the Russian Academy of Medical Sciences. 03/31/2006.
53. Aliyev M.H. Mechanism of abnormality of coagulability of lymph and lymphatic drainage of tissues in the pathogenesis of postresuscitation encephalopathy, their correction. Abstract. diss ... Doctor of med. science, Baku, 2006, p.43.
54. Veliyev P.M., Ibrahimli F.I., Khalilova T.Sh. Experimental pharmacological substantiation of using «AZEOMED» as immunotropic means. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.105-112.
55. Aliyev N.A., Veliyev P.M. Using of «AZEOMED» in sport as immunocorrector to increase the physical workability of sports-men. "Zdorovye" scientific-practical journal, Baku, 2004, № 2.

56. Veliyev P.M. Effectiveness of taking the immunotropic drugs of licorice in the complex treatment of some diseases in children: Diss... Cand. of med. science, Moscow, 1997, p.158.
57. Karl Hecht. ««AZEOMED»» (Nanosiliseo): mineral food additive for improving the quality of life and for supporting applications in the treatment. / Report at the session of the AS IAS.
58. Ibrahimli F.I. Some aspects of abnormality violation of lymphatic drainage of tissues and the possibility of its regulation in acute infarction of internal organs. Abstract. diss ... Doctor of med. science. Moscow, 1993, p. 25.
59. Khaitov P.M., Pinegin B.V. Modern immunomodulators, basic principles of their application. Immunology 2000, № 5, p. 5-8.
60. Veliyeva M. N., Khalilov E. N., Veliyev P.M. Comparative studies of immunostimulate and antihypoxant properties of «AZEOMED» and glysiram. Science Without Borders. Transactions of the International Academy of Science.H&E. Vol.2. 2005/2006, p.116 – 126.
61. Veliyev P.M., Omarov Z.M. Khalilova T.Sh. Studying of the influence of mineral complex ««AZEOMED»» on some parameters of cellular and humoral immunity at laboratory animals. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.83-91.
62. Veliyev P.M., Khalilova T.Sh. Development of preparations which have immunotropic and antihypoxant activity of natural raw material for using in sport. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.92-104.
63. Sadikhova F.E., Eyvazova S.A., Sadigov R.V., Akhmedova L.M., Gadzhiev G.K. Characterization of the immune status of patients with recurrent papillomavirus infection in the dynamics of treatment using the «AZEOMED» mineral complex. Modern high technology. No. 5, 2012, p. 18-21.
64. Mammadli F.M., Khalilova T.Sh., Sadykhova F.E., Kahramanova X.T. Surveillance of poliomyelitis infection – topical problem of modern health. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p. 47-52.
65. Guidelines for virological studies polio "(Global Programme for Vaccines and Immunization. Expanded Programme of Immunization. World Health Organization), Geneva 1998.
66. Zhdanov V.M., Gaydamovich S.A. "Virology," "Medicine", M, 1966.
67. Sadikhov F.E, Kahramanova H.T., Khalilov E.N. "Study of sorption properties of modified natural zeolite cations – clinoptilolite on pathogens of bacterial and viral flora" (Journal of Oncology), № 1, 2006.

68. Patent Azerbaijan Republic "Concentrating viral flora of the little waste-waters» № 20060040 with 02 F 1 / 28, 10, 12, 28. "Zəif çirklənmiş suların virus florasının qatılaşdırılması üsulu", İxtira, i 20060040.
69. Bukrinskaya A.G. "Virology", "Medicine", Moscow, 1986, p.184-186.
70. Kochetasova Z.N., Efremova S.A., Rybakova A.M. "Sanitary microbiology and virology," "Medicine", Moscow, 1987, p.265.
71. The use of zeolites as treatment and prevention of food additives. St. Petersburg State Technical University, ICF, Branch of "Engineering systems of buildings and structures" "Venture", p. 8-10.
72. Luchshev V.I., Vatutina O.V., Shahmardanov M.Z. "Enterosorption in the complex therapy of acute intestinal infectious diseases. Russian State Medical University, Moscow, 2002.
73. Uspenskaya I.G., Ivasivka S.V., Yankevich L.G., Academician AN USSR Ovcharenko F.D. DAN USSR, v.270, № 2, 1983, p. 480-482.
74. Khalilov E.N., Guvalov A. Pat. AR # 120050011.
75. Sadikhova F.E., Kahramanova K.T., Khalilov E.N. To adsorption of malignant cellular populations on modified zeolites. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.43-53.
76. Khalilov E.N., Sadikhova F.E., Kahramanova K.T. ««AZEOMED»» is a zeolite sorbent of viral and bacterial flora. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.30-37.
77. Khalilov E.N., Khalilova T.Sh. Sadikhova F.E., Kahramanova K.T. Selective adsorption of bacterial flora on ««AZEOMED»». In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.38-42.
78. Granitov V.M., Khoroshilova I.A., Shabanova S.V. Violation of microbiocenosis of the bowel in patients with parenteral viral hepatitis / Altai State Medical University, Barnaul, "Epidemiology and Infectious Diseases» № 6, 2002, p.30-32.
79. Shenderov B.A. Medical microbial ecology and functional food, M, 1998, V2, p. 100-106.
80. "Medical Microbiology", edited by Acad. of RAMS Pokrovskiy V.I., Medicine, Moscow, 1999, p. 74-76.
81. Zaprudnov A.M., Mazankova L.I. Microbial flora of bowels and probiotics – M., 1999, p. 24-35.
82. Krasnogolovets V.N. Dysbacteriosis of intestine – M., Medicine, 1989, 208.
83. Blokhina L.V., Kochetkov A.M. Functional constipation syndrome: experience in the use of specialized dairy products and dietary supplement.

84. Sadykhova F.E., Khalilova T.Sh., Jahanov M.M., Ibrahimova S.M. Results of researches of adsorption properties of natural zeolite relative to bacillus anthracis. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.54-56.
85. Sadikhova F.E., Khalilova T.Sh. Shikhaliyeva Sh.T. To the problem of adsorption of cell population infected with cyto-megalovirus on natural zeolite. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.57-62.
86. Sadykhova F.E., Khalilova T.Sh., Ahmedov R.A., Radjabov M.A. To the adsorption of y. enterocolitica on natural zeolite. In book: Natural zeolite in medicine. SWB, Bourgas, 2010, p.63-68.
87. Radjabov M.A., Sadykhova F.E., Qasimov M.S., Ahmedov R.A. The adsorption of y. enterocolitica on natural zeolite. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p.73-79
88. Ibragimova S.M. The researching results of adsorption opportunities of natural zeolites for the bacillus anthracis. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, pp.
89. Eyvazova S.A., Khalilova T.Sh.. To the question of epidemiology and treatment of papovavirus infection in Azerbaijan. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, pp. 105-108.
90. Eyvazova S.A. Mineral sorbents in the complex treatment of human papillomavirus infection. Biomedicine, No. 4, 2011, p. 23-25.
91. Radjabov M.A., Sadykhova F.E., Qasimov M.S., Ahmedov R.A. The adsorption of y. enterocolitica on natural zeolite. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p.73-79.
92. Ibragimova S.M. The researching results of adsorption opportunities of natural zeolites for the bacillus anthracis. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, pp.
93. Eyvazova S.A., Khalilova T.Sh.. To the question of epidemiology and treatment of papovavirus infection in Azerbaijan. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p. 105-108.
94. Eyvazova S.A. Mineral sorbents in the complex treatment of human papillomavirus infection. Biomedicine, No. 4, 2011, p. 23-25.
95. Shikhaliyeva Sh. T., Khalilova T. Sh., Sadikhova F. E. Adsorptive properties of natural zeolites concerning cell population infected by cytomegalovirus. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p. 144-148.

96. Shikhaliyeva Sh.T., Khalilova T.Sh. Application of natural zeolite "«AZEOMED»" as an adsorbent of cytomegaloviruses. Proceedings of the International Congress "Natural Cataclysms and Global Problems of the Modern Civilization". Istanbul, 19-21 September, 2011, p. 411-413.
97. Rajabov M.A., Sadykhova F.E., Khalilova T.Sh. About the problem y.enterocolitica. Proceedings of the International Congress "Natural Cataclysms and Global Problems of the Modern Civilization". Istanbul, 19-21 September, 2011, p. 413-416.
98. Rzayeva L.F., Khalilova T.Sh., Sadikhova F.E.. Correction of dysbacteriosis in application of «AZEOMED» natural zeolite. Proceedings of the International Congress "Natural Cataclysms and Global Problems of the Modern Civilization". Istanbul, 19-21 September, 2011, p. 419-421.
99. Sadikhova F. E. Studying the adsorption properties of the modified zeolites and tablets "«AZEOMED»" rather malignant a cellular population from bacteria and viruses. natural cataclysms and global problems of the modern civilization. Special edition of Transaction of the International Academy of Science. H&E. ICSD/IAS, Baku-Innsbruck, 2007. p.541-542.
100. Ibragimova S.M., Khalilova T.Sh.. Anthrax and the possibility of adsorption of natural zeolite. Proceedings of the International Congress "Natural Cataclysms and Global Problems of the Modern Civilization". Istanbul, 19-21 September, 2011, p. 408-410.
101. Subbotina E. Experience of treatment with «AZEOMED» in patients on oncological pathology. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p. 109-111.
102. Zarkovic N, Zarkovic K, Kralj M, Borovic S, Sabolovic S, Blazi MP, Cipak A, Pavelic K. Anticancer and antioxidative effects of micronized zeolite clinoptilolite. *Anticancer Res.* 2003 Mar-Apr;23(2B):1589-95.
<https://www.ncbi.nlm.nih.gov/pubmed/12820427>
103. Krešimir Pavelić, Mirko Hadžija, Ljiljana Bedrica, Jasminka Pavelić, Ivan Đikić, Maša Katić, Marijeta Kralj, Maja Herak Bosnar, Sanja Kapitanović, Marija Poljak-Blaži, Šimun Križanac, Ranko Stojković, Mislav Jurin, Boris Subotić & Miroslav Čolić. Natural zeolite clinoptilolite: new adjuvant in anticancer therapy. *Journal of Molecular Medicine* volume 78, 2001, p.708–720.
<https://link.springer.com/article/10.1007%2Fs001090000176>
104. Anticancer and anti oxidative effects of micronized zeolite clinoptilolite. *Anticancer research* 23(2B):1589-95 · November 2002.
https://www.researchgate.net/publication/10696990_Anticancer_and_anti_oxidative_effects_of_micronized_zeolite_clinoptilolite

105. Abd-Elsatar AG, Farag MM, Youssef HF, Salih SA, Mounier MM, El-Meliegy E. Different zeolite systems for colon cancer therapy: monitoring of ion release, cytotoxicity and drug release behavior. *Prog Biomater.* 2019 Jun;8(2):101-113. doi: 10.1007/s40204-019-0115-8. Epub 2019 May 20.
<https://www.ncbi.nlm.nih.gov/pubmed/31111378>
106. Zeolite Structures Loading with an Anticancer Compound As Drug Delivery Systems. *The Journal of Physical Chemistry C* 116(48) · November 2012.
https://www.researchgate.net/publication/235327520_Zeolite_Structures_Loading_with_an_Anticancer_Compound_As_Drug_Delivery_Systems
107. Hismatova E.A. Clinical trials of «AZEOMED» mineral composition. In book: *Natural zeolite in medicine.* SWB, Bourgas, 2010, p.113-122.
108. Hismatova E.A. Practical examples of examination by means of computer medical system of analysis of therapy (AMSAT). In book: *Natural zeolite in medicine.* SWB, Bourgas, 2010, p.123-202.
109. Muradhanova S.A. The relevance of «AZEOMED» in medicine. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p.137-142.
110. Ibadova H.I. Medical aspects on the practical application of biologically active mineral complex "«AZEOMED»". In book: *Natural zeolite in medicine.* SWB, Bourgas, 2010, p.203-218.
111. Muradhanova S.A. Clinical observations. In book: *Natural zeolite in medicine.* SWB, Bourgas, 2010, p.219-233.
112. Muradhanova S.A., Khalilova T.Sh.. The relevance of «AZEOMED» in medicine. Proceedings of the International Congress “Natural Cataclysms and Global Problems of the Modern Civilization”. Istanbul, 19-21 September, 2011, p. 405-408.
113. Ibadova Kh.I., Khalilova T.Sh. Trace elements in medicine. Proceedings of the International Congress “Natural Cataclysms and Global Problems of the Modern Civilization”. Istanbul, 19-21 September, 2011, p. 416-418.
114. Sharifzadeh G.F., Nasibova A.N., Khalilov R.I. Zeolite – clinoptilolite – “«AZEOMED»”. Application of natural zeolites in medicine and cosmetology – ZEOMEDCOS. SWB, Baku-London, 2010, p.98-104
115. 2019–20 coronavirus pandemic in mainland China.
https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic_in_mainland_China

116. Tomas Pueyo. Coronavirus: Why You Must Act Now.
<https://medium.com/@tomaspueyo/coronavirus-act-today-or-people-will-die-f4d3d9cd99ca>
117. Application of natural zeolites in treatment of intoxication. Series: Intoxication. (Under the editorship of T.Sh.Khalilova), SWB, London-Baku, 2013, p. 42.
118. Application of natural zeolites in the treatment of gastrointestinal disturbances. Series: gastrointestinal tract. (Under the editorship of T.Sh.Khalilova), SWB, London-Baku, 2012, 24 p.
119. Application of natural zeolites in the treatment of allergosis. Series: Allergosis. (Under the editorship of T.Sh.Khalilova). SWB, London-Baku, 2013, p. 25.
120. 2019–20 coronavirus pandemic in mainland China.
https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic_in_mainland_China
121. Tomas Pueyo. Coronavirus: Why You Must Act Now.
<https://medium.com/@tomaspueyo/coronavirus-act-today-or-people-will-die-f4d3d9cd99ca>
122. Middle East Respiratory Syndrome Coronavirus Infection Dynamics and Antibody Responses among Clinically Diverse Patients, Saudi Arabia. Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 25, No. 4, April 2019.

Patent List:

123. Harley Kaufman. Epitelial cell cancer drug. Patent USA № US 6,288,045 B1, Sep.11.2001
124. Khalilov E.N., Khalilova T.Sh. et al. Biologically active additives. Eurasian patent No. 012751, issued December 30, 2009.
125. Khalilov E.N., Guvalov A.A. Dietary supplement. Eurasian patent No. 005235, issued 12/30/2004.
126. Khalilov E.N., Veliev P.M. Dietary supplement. Eurasian patent No. 015822, issued December 30, 2011
127. Halilova T.Sh., Velieva M.N., Veliev P.M. Immunostimulating agent. Azerbaijan Patent AZ No. i20140009, issued in 2014.
128. Khalilov E.N., Khalilova T.Sh., Ismayilov S.A. Dietary supplement. Azerbaijan Patent AZ No. i20070081, issued in 2007.
129. Khalilov E.N., Dzhafarov A.A. Dietary supplement. Azerbaijan Patent AZ No. i20080017, issued in 2008.
130. Khalilov E.N., Guvalov A.A. Dietary supplement. Azerbaijan Patent AZ No. i20050011, issued in 2005.

131. Savoley E.N., Khalilov E.N., Karl Geht. Dietary supplement. Azerbaijan patent
132. AZ No. i20060117, issued in 2006.
- Halilova T.Sh., Sadikhova F.E. et al. Enterosorption method. Azerbaijan Patent AZ
No. i20140008, issued in 2008.
133. Musaev A.V., Khalilova T.Sh.et al. Means for the treatment of the
musculoskeletal system based on refined naphthalan mixed with zeolite. Eurasian
patent No. 021871, issued September 30, 2015.
134. Khalilov E.N., Sadikhova F.E. et al. Method for the concentration of viral flora
from slightly polluted waters. Azerbaijan Patent AZ No. i20060040, issued in
2006.

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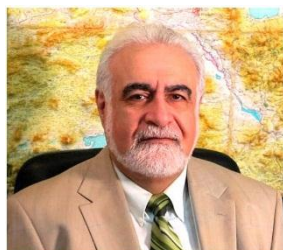
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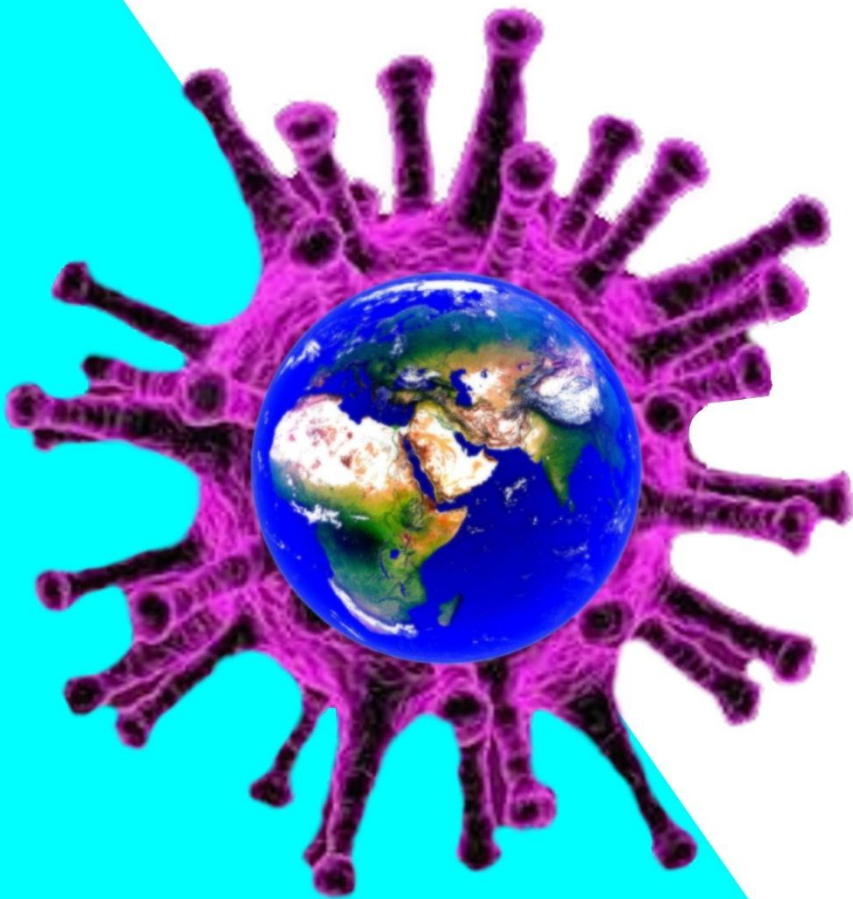
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