

BALNEOLOGY IN BULGARIA

BALNEOLOGY IN BULGARIA – PAST, PRESENT AND FUTURE

Tatyana Angelova, MD,PhD, Maria Stoycheva, Tsvetelina Kaneva, MD,PhD

Bulgarian Union of Balneology and SPA Tourism



Bulgaria is located in the central part of the Balkan Peninsula and has varied relief, which defines its specific climate.

Zones with moderate continental and transitional continental climate, low, medium and high mountain and sea climate and climate zones affected by the Mediterranean prevail.





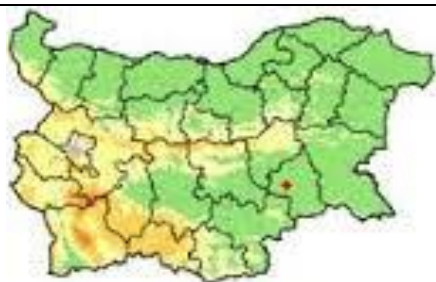
Bulgaria has 130 fields of mineral water with more than 500 utilized water sources with flow rate exceeding 4 500 l/sec. They are located in environment-friendly areas countrywide.

Mineral waters are of depth origin that determines their constant physicochemical composition and their protection against anthropogenic pollutants.



Warm and hot mineral waters with temperature exceeding 40 °C prevail in the country. The only geyser on the Balkans with water temperature of 103 °C is located in the southwestern part of the country.

	<p>VELINGRAD – the city with the four sources and the greatest mineral water resources of the Balkan.</p>
<p><u>Kamenitsa</u></p> <ul style="list-style-type: none"> ▪ Temperature 84° C ▪ Total mineralization 830 mg/l ▪ Metasilicic acid 134 mg/l ▪ Radon 66 Bq/l ▪ pH 7,9 	<p><u>Chepino</u></p> <ul style="list-style-type: none"> ▪ Temperature 48° C ▪ Total mineralization 220 mg/l ▪ Metasilicic acid 63 mg/l ▪ Radon 370 Bq/l ▪ pH 9,2
<p><u>Draginovo</u></p> <ul style="list-style-type: none"> ▪ Temperature 96° C ▪ Total mineralization 740 mg/l ▪ Metasilicic acid 142 mg/l ▪ Radon 81 Bq/l ▪ pH 8,3 	<p><u>Ladzhene</u></p> <ul style="list-style-type: none"> ▪ Temperature 61° C ▪ Total mineralization 370 mg/l ▪ Metasilicic acid 85 mg/l ▪ Radon 44 Bq/l ▪ pH 9,4
	<p><i>THERE ARE ALSO COLD MINERAL WATER SOURCES – below 20° C.</i></p>
	<p><u>village of Voneshta Voda, district of Veliko Tarnovo</u></p> <ul style="list-style-type: none"> ▪ Temperature 12° C ▪ Total mineralization 1 275 mg/l ▪ H₂S 12 mg/l ▪ CO₂ 123 mg/l ▪ pH 6,7
	<p><u>village of Inzovo, district of Yambol</u></p> <ul style="list-style-type: none"> ▪ Temperature 14 °C ▪ Total mineralization 2 850 mg/l ▪ pH 6,9



MINERALIZATION

80% of the mineral waters of Bulgaria have mineralization less than 1 g/l and very good organoleptic properties.

There are waters with total mineralization from 122 mg/l, Knyazhevo – Sofia, to 340 000 mg/l – the brines in Provadia, in the north-east part of Bulgaria.

CHEMICAL COMPOSITION

The most common ions are: hydrocarbonate, sulphate, sodium, calcium, magnesium, fluorine, etc.

The most common gases are hydrogen sulphide and radon.

PELOIDS



Limans, peat and peat-spring sources can be found on the territory of the country.



Liman mud fields in Bulgaria

are located along the Black Sea coast: the lakes Shablenska Tuzla, Balchishka Tuzla, Varnensko, Pomoriysko and Atanasovsko.



The only peat field is located next to the village of Baykal, district of Kyustendil – in the western part of the country.

Peat-spring fields are located in the central and southwestern part of Bulgaria – in the village of Banya, district of Plovdiv, and in the village of Marikostinovo, district of Blagoevgrad, respectively.

TRADITIONS AND ACHIEVEMENTS IN THE FIELD OF BALNEOTHERAPY AND SPA THERAPY

Many archeological findings on the territory of the country are evidence for the use of mineral waters for remedial purposes since ancient times.



Thracian medicine is known to be nature-related therapy relevant to mineral waters and remedial herbs.

Thracians made a cult of spring waters. Their religion was characterized with a cult of waters – Gods of rivers and springs.







Sacred rituals accompanied with religious and remedial rituals were performed in their honor.

For this purpose they built special facilities – sanctuaries, which were later called *Nympheums*.

◀ village of Kasnakovo, district of Haskovo

Ancient Greeks who lived across our land had worshiped mineral waters, which is evidenced by the coins they had cut. They had known the remedial power of waters and had thus erected beautiful *Nympheums* around the mineral springs. Inside and around

	<p>them they had performed special remedial rituals.</p>
	<p>During the <i>Roman Empire</i> settlements were erected around the mineral sources, which were established as remedial, cultural and administrative centers.</p> <p>◀ Hisar (Diocletianopolis)</p>
	<p><u><i>Roman therms across Bulgaria</i></u></p> <ul style="list-style-type: none"> ■ <i>Ulpia Serdika – today's Sofia</i> ◀ <i>Odesos - Varna</i> ■ <i>Aqua Kalide – Burgaski Bani</i> ■ <i>Tonzos – Slivenski Bani</i> ■ <i>Ulpia Pautalia - Kyustendil</i> ■ <i>Germania – Sapareva Banya</i> ■ <i>Dozudava – Sandanski, etc.</i>
	<p><u><i>Middle Ages</i></u></p> <p><i>Traditions in the use of remedial waters have been preserved during the period of the Ottoman Empire.</i></p> <p><i>The mineral baths in some cities erected during this period are used even today.</i></p>

<p><i>Balneotherapy in Bulgaria at the end of the 19th century and the beginning of 20th century achieves great success</i></p>	<ul style="list-style-type: none"> ■ In 1895, seven years after the Liberation from the Ottoman Empire, the first catalogue of mineral waters in the country was made. ■ The construction of modern and
-------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



beautiful bath buildings began. They were used for the purposes of hygiene and therapy.

Balneology in the 20th century

During the second half of the last century

1. *The Research Institute of Health Resort Study, Physical Therapy and Rehabilitation (RIHRSPTR)* and
2. *Sanatorium Resort Management (SRM),*

have been established whose successors today are

1. *National Specialised Hospital of Physical Therapy and Rehabilitation and*
2. *Specialised Hospitals of Rehabilitation – National Complex respectively.*

The associates in the Institute carry out a lot of researches to identify the effect of the natural remedial factors – climate, mineral waters and peloids, on human body.

These observations are carried out in collaboration with physicians working in the centers of Resort Management countrywide – Kyustendil, Sandanski, Velingrad, Pomorie, Hisar, Pavel Banya, Banya – Karlovo, Tuzlata, Marikostinovo, Momin Prohod, etc.

■ The effect of balneo and climate therapy on rheumatological, neurological, endocrine and cardiovascular diseases is being studied.

■ Methodologies for drinking and external balneotherapy in case of diseases of the gastrointestinal tract, gall-liver system, in case of renal and urological diseases, metabolic syndrome, etc. are being developed

■ The effect of balneo-, helio- and peloid-therapy on some gynecological, dermatological and joint diseases is being identified.

■ The favourable effect of climate therapy in case of allergic and pulmonary diseases has been undoubtedly proven.


■ This huge clinical has been summarized and described in plenty of scientific publications presented at research forums in the country and abroad.

■ More than 70 thesis and habilitation works explaining the mechanisms of impact of the natural remedial factors.

We pay special attention to our teachers, professors and researchers, who put balneology on a scientific foundation and it took its well-deserved place in prophylaxis

	<p>and rehabilitation of socially significant diseases in our country: <i>Assoc. Prof. K. Kirchev and Prof. S. Kircheva,</i> <i>Prof. D. Kostadinova, Assoc. Prof. Al. Dayski, Prof. E. Ivanova,</i> <i>Assoc. Prof. St. Stamatov, Assoc. Prof. M. Angelova,</i> <i>Assoc. Prof. D. Karakolev, Prof. D. Krasteva,</i> <i>Assoc. Prof. V. Edreva, Prof. K. Shterev,</i> <i>Assoc. Prof. L. Vladeva, Prof. Iv. Angelov,</i> <i>Prof. V. Marinov, Prof. V. Chasovnikarova,</i> <i>Assoc. Prof. G. Gechev, Assoc. Prof. Y. Dafinova,</i> <i>Assoc. Prof. Zh. Kolev, Assoc. Prof. M. Kuyumdzhieva,</i> <i>Assoc. Prof. M. Berberyan, Assoc. Prof. G. Kamenov,</i> <i>Assoc. Prof. S. Dipchikova, Assoc. Prof. Y. Petrovska and many others.</i></p>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

APPLICATION OF MINERAL WATERS

	<p>Mineral waters are used for:</p> <ul style="list-style-type: none"> • BALNEOTHERAPY <ul style="list-style-type: none"> ▶ Drinking balneotherapy ▶ External balneotherapy ▶ Inhalation therapy • HEALTH PROPHYLAXIS • EXTRACTION OF GEOTHERMAL ENERGY
-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

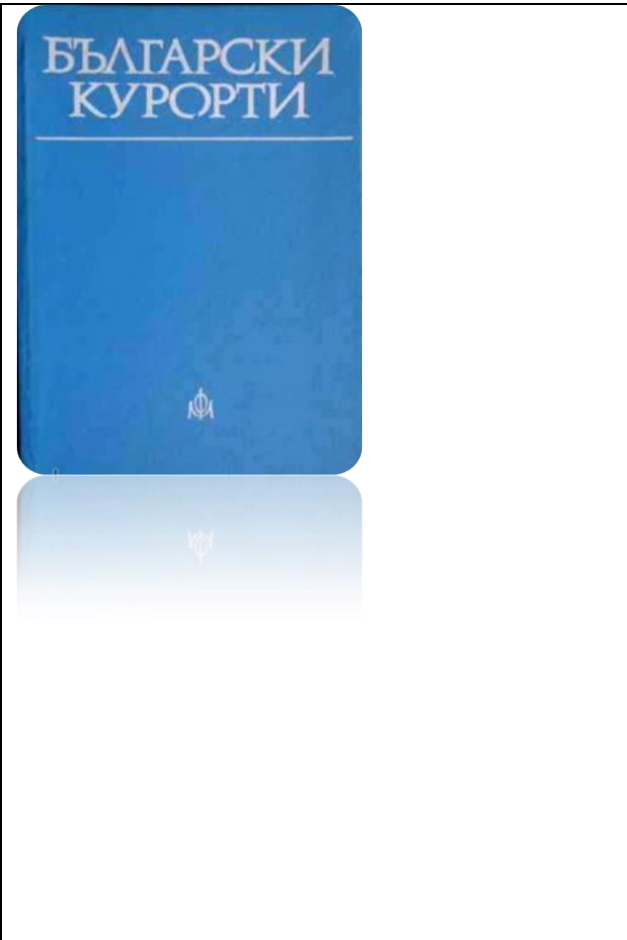
APPLICATION OF PELOIDS

	<ul style="list-style-type: none"> • MUD THERAPY <ul style="list-style-type: none"> ▶ applications ▶ mud baths ▶ Egyptian method • HEALTH PROPHYLAXIS • COSMETICS
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

MONOGRAPHS

MONOGRAPHS IN BALNEOLOGY WERE DEVELOPED ▼

		
BALNEOLOGY	PRINCIPLES OF BALNEOTHERAPY	BALNEOTHERAPY, WATER THERAPY, MUD THERAPY

	<p>◀ “BULGARIAN RESORTS ”</p> <p>■ The many years’ experience in studying climatic resources in the country was described in the monography “<i>Bulgarian Resorts</i> ” which describe:</p> <ul style="list-style-type: none"> - main characteristics of the climate of the resort; - physicochemical characteristics of mineral waters; - physicochemical characteristics of peloids; - diseases that can be treated in the resort. <p>■ Classification of:</p> <ul style="list-style-type: none"> - resorts; - mineral water sources. <p>is made.</p> <p>By means of developing criteria for defining the status of resorts, of the mineral water sources, respectively, they were classified as resorts of <i>national importance</i> and of <i>local importance</i>.</p>
-------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



◀ ATLAS

Zoning of Resorts in Bulgaria

Group of authors: Prof. V. Marinov, Prof. K. Shterev, Prof. V. Chasovnikarova, Assoc. Prof. D. Karakolev and Prof. Iv. Angelov created the ATLAS, which is unique for the country and Europe and precisely and clearly present the bioclimatic and hydromineral resources of the country.

THESIS

► Prof. Dr. Diana Krasteva

Comparative studies of the effect of Pomorie mud and its water extract (1968)

► Assoc. Prof. Dr. Veselina Edreva

Studies on some aspects of the functioning mechanism of the low mineralized thermal water in Sofia (1970)

► Assoc. Prof. Dr. Maruke Berberyan

Opportunities for affecting the water-mineral exchange and the alkaline-acid status of urine during drinking balneotherapy with Gorna Banya mineral water (1974)

► Assoc. Prof. Y. Karaleeva

Study of the economic efficiency of sanitary-resort therapy of patients suffering nephrologic and urologic diseases (1980)

► Assoc. Prof. Lilia Vladeva – Yordanova

Comparative physicochemical studies of peloids in Bulgaria in terms of their application in medicine practice (1981)

► Dr. Mariana Staykova

Experimental and clinical studies on early compensatory hypertrophy and functional adaptation of the kidney remaining after nephrectomy and attempt to affect them with resort factors (1982)

► Dr. Krasimira Vatrlova

On some aspects of the complex resort impact on patients suffering duodenal ulcer (1983)

► Dr. Tatyana Angelova

Impact of the complex balneotherapy on tubulointerstitial nephropathies at the stage of chronic renal insufficiency (1985)

► Assoc. Prof. Dr. Nedyalka Staneva

Physiological microflora and anti-microbe properties of mineral waters within the region in Sofia (1989)

► Dr. Tsvetelina Kaneva

Effect of some mineral waters and optimization of methodologies for their drinking application for patients suffering cholelithiasis (1996)

THE SITUATION IN THE COUNTRY TODAY	<i>REHABILITATION</i>



- There are 46 specialized hospitals of rehabilitation countrywide. 25 of them are state-owned, municipal, and the others are departmental and private healthcare establishments.

- Most of them are located in our famous resorts – Bankya, Varshets, Velingrad, Kyustendil, Sapareva Banya, Sandanski, Pomorie, Burgaski Mineralni Bani, Narechen, etc.

- Qualified medical and non-medical employees work in these hospitals – physicians specializing in physical and rehabilitation medicine, internal diseases, neurology, rehabilitators, kinesiotherapists, massage therapists, etc.

These healthcare establishments are intended for patients with health insurance. Rehabilitation is covered by the National Health Insurance Fund.

HEALTHCARE TOURISM AND BALNEOLOGY



Prophylaxis, Rehabilitation and Recreation
EAD is among the companies approved on the tourist market in Bulgaria. It operates in the field of healthcare tourism and balneology. It has 18 balneo-hotels located in balneo- and climate-remedial resorts. This company is a subsidiary of the National Social Security Institute.

The Prophylaxis and Rehabilitation Programs
provide 10 days' balneotherapy and rehabilitation of individuals at active working age. These programs are implemented both in balneo-hotels and in Specialized Hospitals of Rehabilitation.

The funds for these programs are provided by the National Social Security Institute.

SPA AND WELLNESS TOURISM



During the last decade, balneo-resorts in the country, together with the existing specialized hospitals of rehabilitation offering mainly medical services, numerous modern hotel complexes were developed, which have modern spa and wellness centers intended for preventive medicine. Some of these complexes have medical-spa centers.

FAVOURABLE FACTORS FOR THE DEVELOPMENT OF BALNEO-TOURSIMS IN BULGARIA

- Natural resources:
 - ▶ climate
 - ▶ mineral waters
 - ▶ peloids
 - ▶ herbs, essential oils, etc.
- Traditions in balneotherapy.
- Well-structured and equipped SPA and wellness centers, and
- Well-trained staff.

STAFF

Medical staff (physicians, nurses, rehabilitators) studies in Medical Universities.

Non-medical staff (kinesitherapists) studies in non-medical and medical universities.

The assistants of thermal procedures study in vocational training centers.

The hospitals of rehabilitation employ higher medical staff – physicians specializing in physical and rehabilitation medicine, neurology, internal diseases, pediatrics; nurses (Bachelors), rehabilitators – medical specialists (professional bachelor), kinesitherapists – non-medical specialists (bachelor/master), assistant of thermal procedures, and other specialists.

<i>Patients treated in state-owned and municipal hospitals of rehabilitation</i>	2015
Specialized hospitals of rehabilitation	98 666
Specialized hospitals of continuous treatment and rehabilitation	20 960
Total	119 626
Prophylaxis and Rehabilitation Program	44 000
TOTAL	163 626

Data are provided by the National Center of Public Health and Analysis at the Ministry of Health.

Written by:

Tatyana Angelova, MD,PhD

Maria Stoycheva, MD

Tsvetelina Kaneva, MD,PhD

Experts of Bulgarian Union of Balneology and SPA Tourism