

**Locality: “Velingrad – Ludzhene District”**

**Water source: Ludzhene – Catchment No 21- “Tihia kut”**

**WATER HEALS THE FOLLOWING:**

Diseases of the musculoskeletal system, diseases of the nervous system, metabolic and endocrine diseases, gynaecological diseases, vascular diseases, skin diseases, respiratory diseases, diseases of the digestive system, diseases of kidneys and of urinary tracts, chronic intoxications with heavy metals.

Properties :

1. Physical :

Appearance: clear, colourless liquid, with a faint odour of H<sub>2</sub>S

Temperature : t° = 54°C

pH = 8.55

Solids at 105°C : 0.364 g/l

Radioactivity : nanocuries/l

2. Chemical :

One litre of water contains the following:

		mg	milimoles	mg. equiv.	equiv. %
<b>1.</b>	<b>Anions :</b>				
1.1.	Fluoride	6.4	0.337	0.337	6.51
1.2.	Chloride	15.5	0.436	0.436	8.42
1.3.	Sulfate	99.6	1.036	2.073	40.04
1.4.	Carbonate	6.0	0.100	0.200	3.86
1.5.	Hydrocarbonate	125.1	2.050	2.050	39.60
1.6.	Hydrosilicate	1.1	0.041	0.041	0.27
1.7.	Hydrosulfide	1.9	0.057	0.057	1.10
1.8.	Nitrate	0.5	0.008	0.008	0.16
1.9.	Nitrite	0.1	0.002	0.002	0.04
	<b>Total :</b>			<b>5.177</b>	<b>100.00</b>
<b>2.</b>	<b>Cations :</b>				
2.1.	Ammonium	-	-	-	-

2.2.	Lithium	0.22	0.032	0.032	0.62
2.3.	Sodium	109.4	4.756	4.756	91.87
2.4.	Potassium	2.6	0.066	0.066	1.27
2.5.	Calcium	6.0	0.149	0.298	5.76
2.6.	Magnesium	0.3	0.012	0.025	0.48
2.7.	Lead	-	-	-	-
	<b>Total :</b>			<b>5.177</b>	<b>100.00</b>
	<b>Total :</b>	<b>374.7</b>	<b>9.055</b>	<b>5.177</b>	<b>100.00</b>
<b>3.</b>	<b>Metasilicic acid</b>	<b>85.3</b>	<b>1.093</b>		
3.1.	Including total quantity	86.4	-	-	-
<b>4.</b>	<b>Metaarsenic acid</b>	-	-	-	-
	<b>Total :</b>	<b>460.0</b>	<b>10.148</b>		
5.	<b>Free hydrogen sulfide</b>	0.1	-	-	-
5.1.	Total oxidizable with iodine	2.0	-	-	-

Kurlov formula:  $F_{0.006}H^2SiO^3_{0.086}M_{0.460}SO_{40}(HCO^3+CO^3)_{43}/Na_{92}T_{54}pH8.55$

Source: Vlasa

Locality – Velingrad – Kamenitza District

t = 95°C

**HEALING EFFECTS:**

Skin diseases and cuts, inflammatory processes, gynaecological diseases, joint diseases

Properties :

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Temperature : t° = 54°C

pH = 8.55

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	<b>Total :</b>	<b>374.7</b>	<b>9.055</b>	<b>5.177</b>	<b>100.00</b>
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3.1.	Including total quantity	86.4	-	-	-
<b>4.</b>	<b>Metaarsenic acid</b>	-	-	-	-
	<b>Total :</b>	<b>460.0</b>	<b>10.148</b>		
<b>5.</b>	<b>Free hydrogen sulfide</b>	0.1	-	-	-
5.1.	Total oxidizable with iodine	2.0	-	-	-

Kurlov formula:  $F_{0.006}H^2SiO^3_{0.086}M_{0.460}SO_{40}(HCO^3+CO^3)_{43}/Na_{92}T_{54}pH_{8.55}$

Water from Ludzhene District (with fluoride content of 5.5 mg/l) can be used for mineral water drinking therapy, for which the balneological criterion is up to 8 mg/l, but the fluorine presence exceeds the permissible concentration for bottling- 5 mg/l. Water from Kamenitza District (with fluoride content of 8.6 mg/l) is suitable only for mineral water balneological therapy and for fluoride prevention in accordance with the specified dosage.

The main mechanism of action of all weakly mineralized waters, such as Velingrad waters, originates from their low mineralization and, consequently, from their manifested hypotonicity. As a result of that, during mineral water drinking therapy, and in comparison with the other types of mineral waters, the weakly mineralized waters exhibit greater osmotic action and cause a greater degree of absorption and elimination of the waste products from the body. That process is also facilitated by the better structure of the warm and hot weakly mineralized mineral waters, which can be explained by their formation deep

in the earth at high temperature and under great pressure. That structure is similar to the structure of the fluids in the human body, and for that reason they are easily absorbed and digested by the body, with less energy consumption. The body can utilise the saved energy to increase its defence mechanisms and for healing. In addition to all of the above, the weakly mineralized waters have flushing effect on tissues, organs and systems and lead to increased excretion of urine (increased diuresis) and to better flushing of the urinary tracts. The excretion of large quantity of urine leads to elimination of waste metabolic products and of toxic substances that may have entered the body.

In addition to those main mechanisms, consideration should always be given to the specific activity of individual chemical ingredients, that are present in significant quantities. In the mineral waters of Ludzhene District and Kamenitza District those are fluoride and metasilicic acid.

Fluoride is necessary for the formation of bones, for the normal development of hair, nails, and of children's teeth – for caries prevention. Fluoridated waters have proven radioprotective effect (G. Kalaidzhiev).

Metasilicic acid activates the cells' protoplasm, has antitoxic and antiseptic effect, has beneficial influence on the digestive system, on the turgor and on the elasticity of the skin and also has good cosmetic effect.

Velingrad mineral waters are used for therapy and for prevention of various diseases, depending on their non-specific and specific action.

## **THERAPY AND PREVENTION WITH MINERAL WATER FROM LUDZHENE DISTRICT**

### **Mineral water drinking therapy in Ludzhene District**

When administered orally, mineral water from Ludzhene District is especially efficient in treatment of diseases of kidneys and of urinary tracts. It leads to enhanced flushing of the urinary tracts, to increased excretion of urine, and consequently, of salts, sand-like particles, small kidney stones, and inflammatory waste products. It causes dilution of the urine and regulation of the alkaline or acid reaction of the urine (pH) towards the neutral point. Thus, it prevents the formation of kidney stones, since their formation largely depends on the condensed urine and its pH. In cases of uncomplicated kidney stone disease,

a large amount of water is taken for therapy, and it is more in the summer due to perspiration, and less in the winter. The water should be taken daily at 30 ml/kg body mass in the summer, at 25 ml/kg in the spring and in the autumn, and at 20 ml/kg in the winter.

In cases of chronic inflammation of the kidneys, drinking of mineral water eliminates inflammatory waste products and alters urine reaction (pH), thus creating unfavourable conditions for the vital activity of microorganisms.

In cases of more manifested damage to the renal parenchyma, smaller amounts of water should be taken – approximately 150-200 ml, with temperature 37°C, three times daily.

In cases of mineral water drinking therapy of digestive diseases, the mineral water passes through the whole gastrointestinal tract – mouth, oesophagus, stomach, intestines – affecting them all mechanically, chemically and reflexively.

In chronic gastritis and peptic ulcer disease the schedule of mineral water drinking depends on the acidity of the gastric juice. If the acidity of the gastric juice is reduced, the mineral water should be taken 15-20 minutes before meals, thus irritating and activating the gastric mucosa. In the first 2-3 days less mineral water – 100-150 ml – should be taken, three times daily. If the acidity of the gastric juice is increased, which is a more common occurrence, the mineral water should be taken before meals – 300-600 ml, with temperature 38-45°C, three times daily, taken all at once. If the acidity is normal, the mineral water should be taken 45 minutes before meals – 200-250 ml, three to four times daily. In cases of frequent abdominal pain, and also postoperatively, smaller amounts of mineral water should be taken – 100-150 ml, with temperature 37°C, three to four times daily. In cases of chronic colitis, the schedule of mineral water drinking depends on whether the patient has constipation or diarrhoea. In cases of constipation, which is a common occurrence in patients, the mineral water should be taken lukewarm, with temperature 18-22°C, 200-250 ml, three times daily. In cases of frequent diarrhoea, the mineral water should be with temperature 36-40°C, 150-200 ml, three times daily, one hour before meals.

In cases of diseases of the liver and gall bladder, the mineral water drinking therapy influences the inflammatory process, improves the processes of formation and secretion of

bile and enhances the complex and diverse functions of the liver in the metabolic processes. The mineral water should be taken 200-300 ml at a time, with temperature 40-45°C, forty-five minutes to one hour before meals. Only in cases of concurrent constipation, lukewarm water with temperature of 18-22°C should be taken, and if loosening of stools would appear, the amount of water taken should be reduced to 300-400 ml daily, or should be discontinued temporarily. The duration of the therapy is 30 days, twice to three times a year.

In cases of endocrine-metabolic diseases (gout, diabetes, obesity), the mineral water drinking therapy improves the metabolic processes via complex neuro-reflex and endocrine mechanisms. In cases of diabetes such therapy should be applied in mild and moderate types of the disease as auxiliary means. The mineral water should be taken on an empty stomach three times daily before meals – 400-600 ml in the morning, 200-400 ml at lunch time, and 200 ml in the evening, with temperature 40°C, in sips, with pauses. In patients suffering from obesity, the same approach should be used, but the mineral water should be lukewarm or cold, and in cases with constipation the respective portion of mineral water should be taken all at once. In cases of gout, the administration of the mineral water drinking therapy is especially efficient. The mineral water taken helps the regulation of urinary metabolism, which is impaired in cases of gout. Essential in the mechanism of the treatment is the elimination of the increased amount of urea, which is typical for gout, via increased diuresis, with intake of large amounts of water. The therapy is performed with the schedule for kidney stone disease, taking into account the patient's weight and the season of the year. It is also prudent to take into account the physical activity of the patient, since greater physical activity leads to perspiration and loss of fluids, which, in turn, should be compensated with greater mineral water intake.

In cases of chronic occupational intoxications with lead, mercury, bismuth, harmful substances released by the pharmaceutical industry, radionuclides, etc., drinking of weakly mineralized water leads to elimination from the body of the toxic substances, along with excretion of increased amount of urine, which, in turn, is achieved through intake of higher doses of mineral water, with the same schedule as for treatment of kidney stone disease.

The mineral water from Ludzhene District is also recommended for caries prevention, as it contains fluoride. The necessary amount of fluoride for humans is 0.7-1.5 mg/l, that is a minimum of 250-300 ml mineral water daily.

For treatment of osteoporosis much greater amounts of mineral water are required.

### **External mineral water balneotherapy.**

In addition to its application for drinking, Ludzhene District mineral water is also widely used for mineral water balneotherapy. External balneotherapy has non-specific effect on the body through its temperature and mechanical factor. It achieves readjustment of the body and positive influence of the disease processes. Warm water favours the blood supply and nutrition of tissues, reduces spasms and has a soothing effect. A certain non-specific effect of Ludzhene District mineral water can be expected in cases of bone and joint diseases through fluoride resorption, and also through absorption of metasilicic acid on the skin.

Mineral water drinking therapy recommended in the above-mentioned diseases is most frequently combined with external balneotherapy. In addition to such cases, external balneotherapy is especially efficient in the treatment of rheumatic, traumatic orthopaedic, neurological, gynaecological, cardiovascular and skin diseases. It is applied in pools and in bathtubs.

Baths are taken every other day or two, according to a schedule, with a day off, with a gradual increase of the duration of 5-15-20 minutes, with temperature of 37-38-39°C, and in cases of neuroses and hypertensive disease – more often with temperature of 36°C, and even lower in some cases. A course of treatment includes twelve to fifteen baths, and can be done twice or three times a year.

### **TREATMENT AND PREVENTION WITH KAMENITZA DISTRICT MINERAL WATER**

The mineral water from Kamenitza District is characterized by the presence of small amounts of hydrogen sulfide in it. Although the hydrogen sulfide in it is only 2 mg/l, it gives the mineral water a specific unpleasant smell.

The mineral water temperature at source is 88°C. It is characterized as weakly mineralized, sulphate-carbonate-sodium, fluorine and silicon. It contains very little magnesium, but the presence of fluoride and metasilicic acid in it is the largest compared to the other sources in Velingrad and it is in therapeutic concentrations. The small amount of hydrogen sulfide present in sulfur water may play a specific role in the treatment of some diseases, especially joint diseases in which there is an established sulfur deficiency in the articular cartilage. Sulfur water has very good results in the treatment of degenerative joint diseases – bone spurs of the spine (spondyloarthritis), of the knee joints (gonarthrosis), of the hip joints (coxarthrosis), etc, as well as in the treatment of inflammatory joint diseases - rheumatoid arthritis, infectious arthritis, ankylosing spondylitis, etc. The use of sulfur water also leads to good therapeutic results in treatment of patients with neurological diseases - neuralgia, neuritis, plexitis, discopathy, disc herniation; post-traumatic conditions, twists, sprains, etc; occupational diseases - tendovaginitis, myositis, myalgia, vibration disease, etc; gynecological diseases - chronic inflammatory diseases of the ovaries, fallopian tubes, uterus, etc; skin diseases - eczema, dermatitis, psoriasis vulgaris, etc.

Baths are taken in pools and bathtubs with duration of five to fifteen minutes, every other day or two, with one day off. In the bathtubs the water temperature is maintained up to a maximum of 37°C, and in the pool – up to a maximum of 38-39°C. The course of treatment includes twelve to fifteen procedures and can be done twice or three times a year.

### **USE OF VELINGRAD MINERAL WATERS AS TABLE WATERS**

Ludzhene District mineral water can be used for drinking, but with certain intervals, due to the slightly higher fluoride content. It is recommended to patients suffering from osteoporosis, especially to women in advanced age, who most often suffer from this disease. This mineral water is also suitable for fluoride prevention of dental caries, and for people who have been exposed to radionuclides. Kamenitza District mineral water must not be used as a table water. It must not be used for drinking due to its high fluoride content, which can be toxic. In addition to that it has a foul smell due to its hydrogen sulfide content.