TEST REPORT
No. 11/3.07.2023

OBJECT OF THE STUDY - STUDIES OF THE PHYSICAL PROPERTIES OF EVODROP WATER BY GAS-DISCHARGE EMISSION METHOD CONDUCTED AT DNIPRO STATE MEDICAL UNIVERSITY, UKRAINE

TYPE OF RESEARCH – BRIGHTNESS OF GAS-DISCHARGE CORONAL IMAGES OF EVODROP WATER COMPARED WITH OTHER TYPES OF WATERS

Results

The study revealed that EVOdrop filtered water exhibits distinct electro-physical properties compared to typical water types. The analysis of gas-discharge gas discharge coronal images and histogram parameters demonstrated significantly higher Euclidean distances and median values for EVOdrop water. These differences suggest ordering water molecules in clusters transparent to the gas-discharge corona glow. The unique characteristics of EVOdrop water may be attributed to the EVOdrop filtered technology, influencing the structuring of water molecules in clusters.

Euclid distance	Median (pixels)	For median distances (pixels)
1st – distilled water	33430.3	35369.3
2d – tap water	22077.3	23357.8
3d – natural mountain water	20231.5	21404..9
4th – glacier water	38433.5	40662.6
EVOdrop water	63335.0	67008.4

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Summary
Its electrophysical parameters investigated the physical properties of water samples. For this purpose, an experimental study of 50 drops of water sample by corona discharge glow. The water samples were prepared with EVOdrop filtered technology from Switzerland. The control samples were tap water from Sofia, Bulgaria. The patents are Huether, F. Filter System. Fabio and Markus Membrane ENG GMBH. CH Patent WO2020169852A1, 3 January 2019; Huether, F. Water Purifier, Fabio and Markus Turbine ENG GMBH. CH Patent WO2020178200A1, 3 January 2019. The device used is a recorder of gas discharge glow, which allows you to form an external impact on the object of research in the form of a high-frequency (HF) pulsed electric field. The X-ray film was used as the sensor for registering peculiarities of electro-physical processes accompanying the gas discharge. Obtained photos of the gas discharge of 50 drops of water were scanned. Peculiarities of formation of geometrical and photometric parameters of gas-discharge emission were analyzed by the method developed by the authors (Glukhova N.V., L.A. Pesotskaya. Information and simulation technology for assessing the biological characteristics of water. *Perspective technologies and devices*. - No. 19. - 2021. - 34-39). It included the construction of image histograms; analysis of water sample images based on a selection of histogram parameters (medians, median differences, Euclidean distance between medians); obtained parameters were compared with those of typical water samples (distilled water, tap water, from natural sources, functional water with proven therapeutic properties). The investigated water sample, according to its physical properties reflected in electrophysical parameters of gas-discharge glow on X-ray film, corresponds to parameters of functional water from monastery water sources.

Keywords: water, discharge glow, discharge photography, spectroscopy, histogram.

The study aims to investigate the electro-physical properties of a water sample with EVOdrop water based on the results of its corona discharge.

Material and methods
Conducted a gas-discharge study of 50 drops of a water sample. The test object was a water EVOdrop, and the control waters – a distillate, tap, natural mountain water, and glacier water. The instrument used was a gaseous discharge recorder «РЕК 1», Ukraine, Dnipro (Пісоцька Л.А., Чурилов В.В., Мінцер О.П., Глухова Н.В., Гулевська Г.І. Апаратно-програмний комплекс дослідження якості рідиннофазних об'єктів. Пат. на корисну модель №151195 Україна. Заявлено 28/12/2021; опубл. 15/06/2022, Бюл. №24, 4 с.) It allows the formation of an external influence on the research object in the form of a pulsed electric field. The sensor for recording the peculiarities of electro-physical processes accompanying the gas discharge was an X-ray film.
We analyzed the images obtained of the gas-discharge luminescence of the water droplets in the water sample under study. Gas-discharge images of water drops were scanned. Their analysis included the following studies. The first is the construction of histograms of images. The second is an analysis of images of a water sample based on selecting the histogram parameters (medians in the histogram intervals, median differences). The third is comparing the obtained parameters of the water sample under study with the developed classification of parameters by water types (1-distilled, 2-water tap, 3 - natural spring water, 4-glacier water). (Pesotskaya, L.A., Glukhova, N.V., Lapitskiy, V.N. 2013. Analysis of the images of the water drops Kirlian glow. Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu, 1, 91–96.; Glukhova N.V., L.A. Pesotskaya Information and simulation technology for assessing the biological characteristics of water. *Perspective technologies and devices*. - No. 19. - 2021. - 34-39)
When an image's histogram is plotted, all pixels are included in the analysis, considering their luminance. The median value calculated for the corresponding sample of images was used as the

most probable value of the column height. Further classification procedure was based on the use of the metric - the Euclidean distance between the heights of the corresponding columns of the histogram. We analyzed the difference between the heights of the histogram columns in the neighboring intervals.

Additionally, we used the method of analyzing the formation of the spatial geometry of brightness distribution based on the methodology of flicker-noise spectroscopy. The high-frequency components of the obtained image profiles of the glowing corona around the droplets were extracted, and power spectra for brightness parameters were calculated. The water sample parameters were compared with those of typical water samples.

Results

Figures 1-3 present histograms and computer analysis for a sample of test water compared to classes of typical waters (1 reference - distilled; 2 reference - tap water; 3 reference – natural spring water; 4 reference – glacier water. EVOdrop water as experiment water has significantly higher results according to the other four types of water because there is an ordering of water molecules in clusters which are transparent for the GAS- discharge Corronal glow measured with the method of Glukhova and Pesotskaya Euclid distance median For median distances 1st – distilled water 33430.3 35369.3 2d – tap water 22077.3 23357.8 3d – natural mountain water 20231.5 21404..9 4th – glacier water 38433.5 40662.6 EVOdrop water 63335.0 67008.4

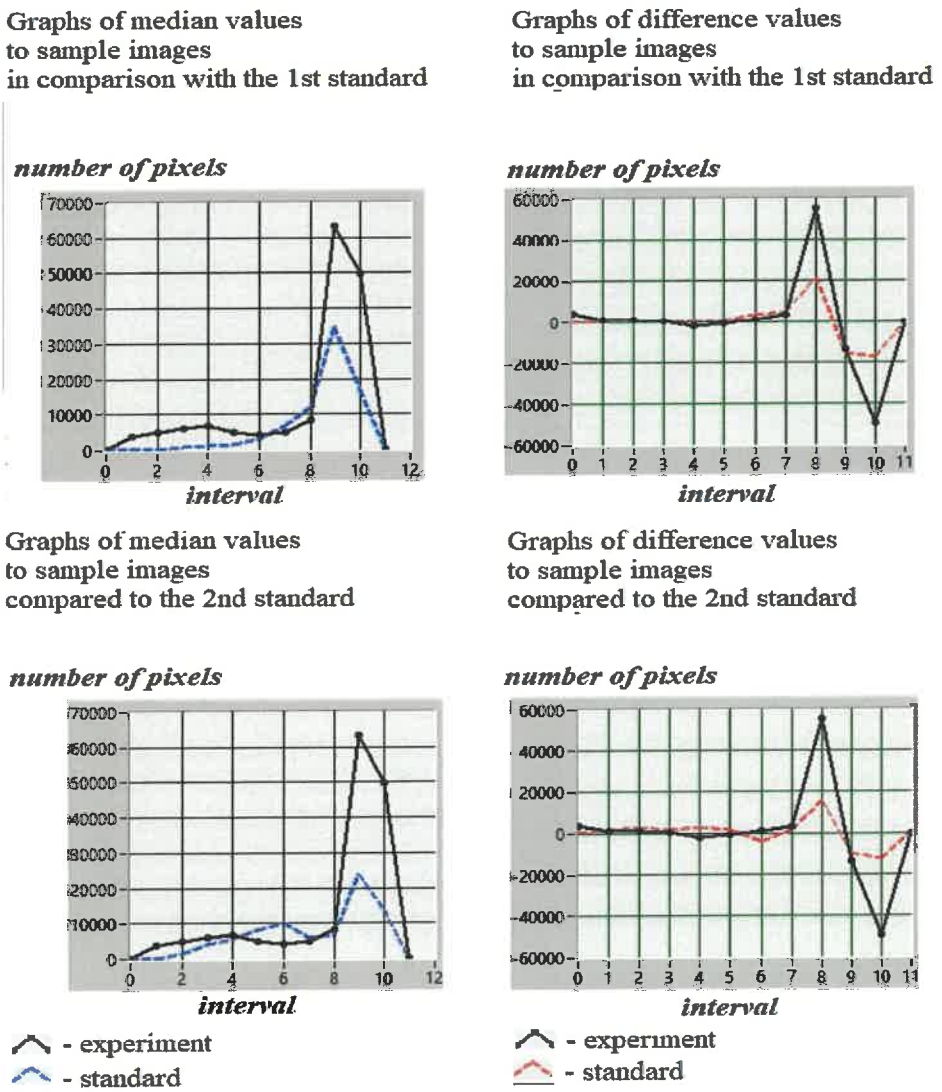
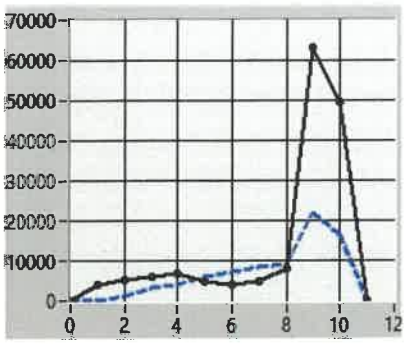


Figure 1. Comparison of the test water sample EVOdrop water with the 1st and 2nd standard

Graphs of median values
to sample images
compared to the 3rd standard

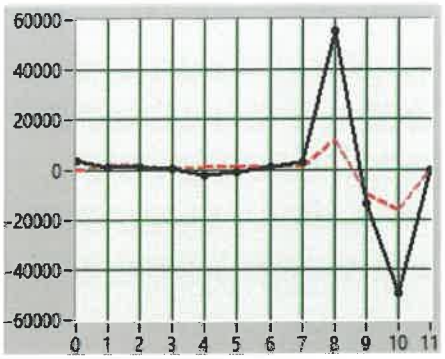
number of pixels



interval

Graphs of difference values
to sample images
compared to the 3rd standard

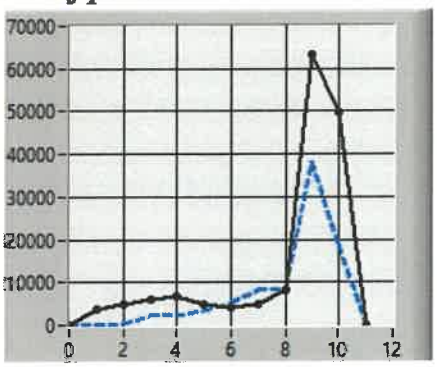
number of pixels



interval

Graphs of median values
to sample images
compared to the 4th standard

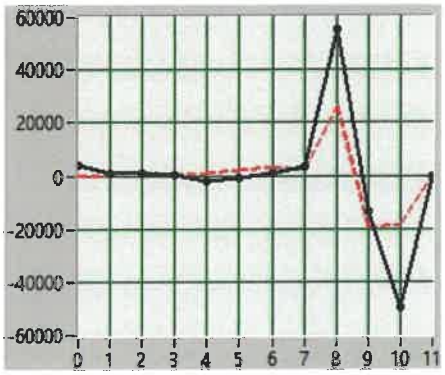
number of pixels



interval

Graphs of difference values
to sample images
compared to the 4th standard

number of pixels



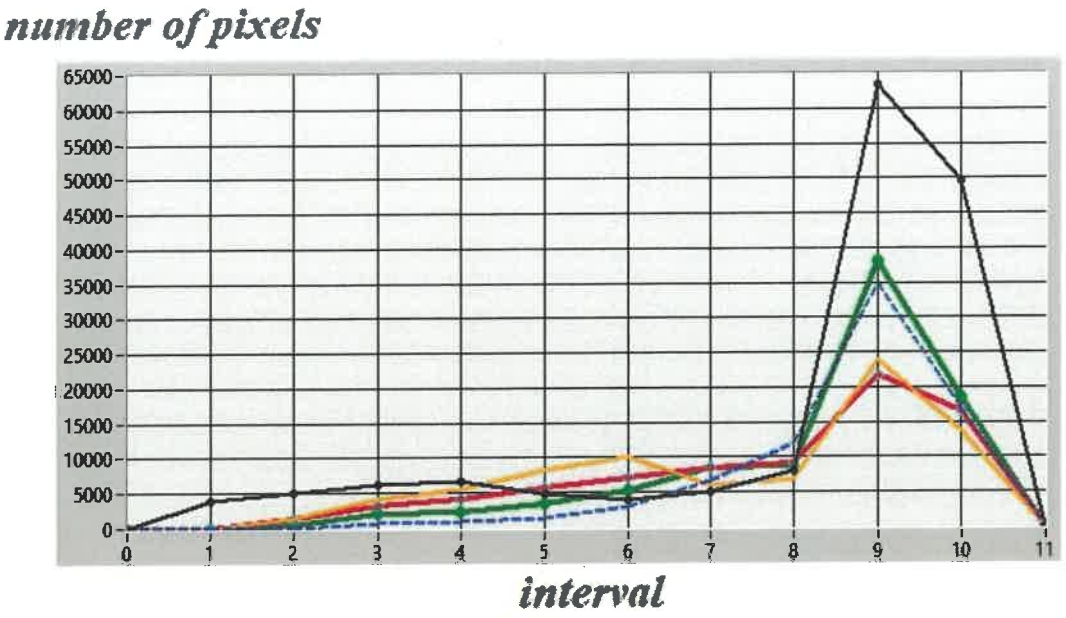
interval

- experiment
- standard

- experiment
- standard

Figure 2. Comparison of the test water sample with EVOdrop water with the 3rd and 4th standard

Graphs of median values for a sample of images in comparison with standards



Difference plots for a sample of images compared to standards

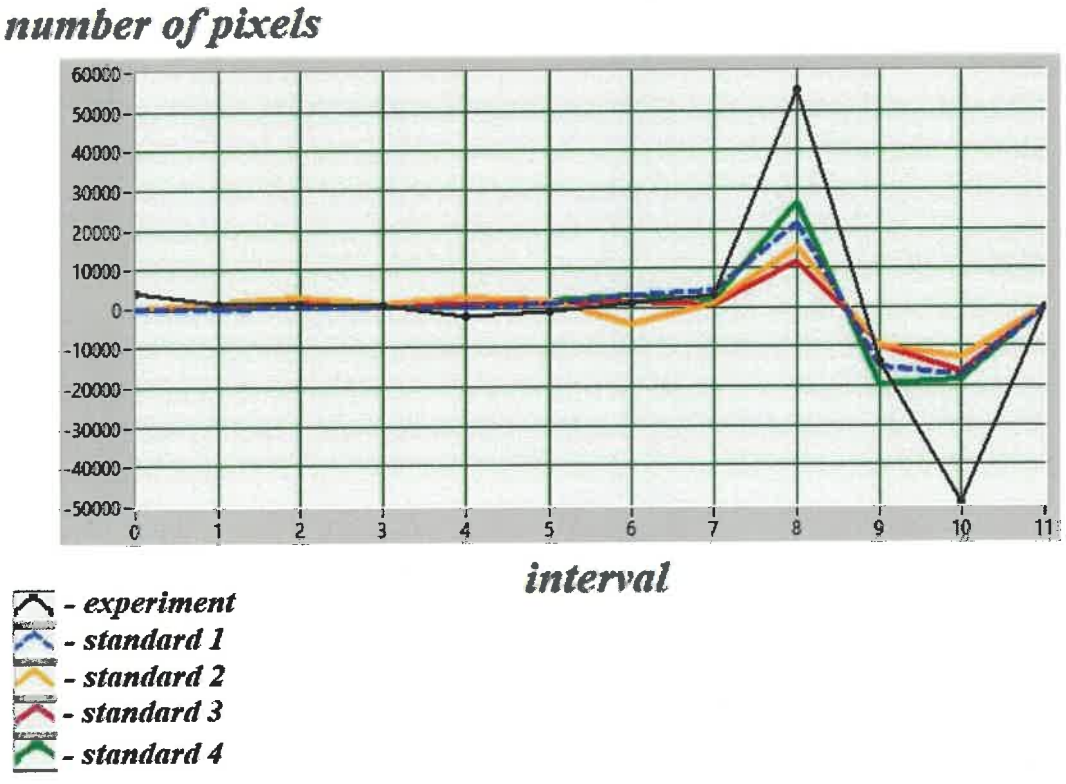


Figure 3. Comparison of the test water sample with EVOdrop water with all standards

Euclidean distance

Euclid distance	Median (pixels)	For median distances (pixels)
1st – distilled water	33430.3	35369.3
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Conclusion

The study aimed to investigate the electro-physical properties of water samples, focusing on the EVOdrop filtered water using corona discharge glow. The investigation involved the analysis of 50 drops of water samples, comparing them to control samples of distillate, tap water, natural mountain water, and glacier water. The gas discharge recorder "PEK 1" was used to apply a high-frequency pulsed electric field and record the electro-physical processes using X-ray film as the sensor.

Analyzing the gas-discharge luminescence images of the water droplets included the construction of histograms and the selection of histogram parameters such as medians and median differences. The obtained parameters of the EVOdrop water sample were compared with a classification of parameters for distilled water, tap water, natural spring water, and glacier water. Additionally, the study employed the methodology of flicker-noise spectroscopy to analyze the spatial geometry of brightness distribution and calculate power spectra for brightness parameters.

The results, as shown in Figures 1-3, demonstrate the differences between the EVOdrop water sample and the reference classes of typical waters. The Euclidean distances and median values for the EVOdrop water were significantly higher than the other four water types. This indicates that the EVOdrop water exhibits distinct characteristics, including ordering water molecules in clusters, which are transparent for the gas-discharge corona glow measured using the method developed by Glukhova and Pesotskaya.

The findings suggest that the EVOdrop filtered water has unique electrophysical properties that differentiate it from other water types. These differences may be attributed to the EVOdrop filtered technology from Switzerland, which likely affects the molecular structure and organization of the water sample.

References

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