PROCESS OF DEHYDRATION OF LIQUIDS WITH DIFFERENT COMPONENTS

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Abstract: *The main directions of research on the crystallization of biological fluids are to determine the changes of crystallization depending on the substances present in the liquid and their amounts, and to study the process of intermolecular composition that occurs during the dehydration of biological fluids and provides information. A lot of scientific information helps us to conclude that human biological fluid (saliva) is a unique substance with great potential for use in basic research and medical diagnosis.*

Keywords: *Biological fluid, crystallization, evaporation.*

Research Relevance. Currently, much attention is being paid to studying the prospects of analyzing biological fluid (saliva) for diagnostic purposes. Biological fluid (saliva) is a complex tool that reflects the dynamic stability of the internal environment of the body, at the same time, oral fluid can have different physical, chemical and biological properties under the influence of various factors, and the body's reactivity is one of the indicators. Depending on the internal structure of biological fluids and their quantities, the physical changes that occur during evaporation and the methods of assessing the solid phase are widely used in laboratory diagnostics, the simplicity of the process of obtaining biological fluids, as well as the availability of high sensitivity and the possibility of obtaining information is one of the current problems that have begun to be studied. It is known that the concept of the relationship between structure and function occupies a central place in physics, biology and medicine. However, although the morphological approach in modern biology and medicine is mainly focused on cellular elements, the problem of structural analysis of biological fluids for the benefit of clinical medicine has not really been considered by researchers.

Research Objective. The purpose of the study is to experimentally and theoretically substantiate the main mechanisms of the structuring of biological fluids in the process of dehydration in the form of drops, that is, during the transition to the solid phase, to determine the nature of structural changes in the solid phase of biological fluids, to

create automated analysis algorithms, to identify morphological signs of pathological conditions in the structural portrait of the solid phase of biological fluids determination.

Usually, when using this method, the physical processes that take place during the evaporation of a certain amount of biological liquid (saliva) that is being examined in the form of drops, and the solid sediment formed after evaporation (facies) morphology is studied.

Biological fluid (saliva) can be a source for studying human DNA in the body and clinical analysis, because the composition of certain molecules in saliva reflects their concentration in blood. Using saliva for various laboratory tests is simpler, safer, and cheaper than using blood, especially when testing children and the elderly.

Research method. 1-1.2 liters of biological fluid (saliva) are secreted every day. Sodium, potassium, calcium and other microelements are found in inorganic substances in biological fluid (saliva). Organic substances in biological fluid (saliva) mainly consist of proteins and salts. The following method was developed to study the structure of the evaporation and solid phase of biological fluids. A biological fluid with a volume between 2 mm3 and 5 mm3 is dripped horizontally onto a flat glass placed horizontally. The diameter of one droplet is between 2-5 mm, and its temperature is between 20-25 °C and relative humidity is observed without changing.

Object of inspection. Usually, when using this method, the morphology of a solid deposit (facies) formed after drying a certain amount of the examined biological liquid, which takes the form of a drop, is studied.

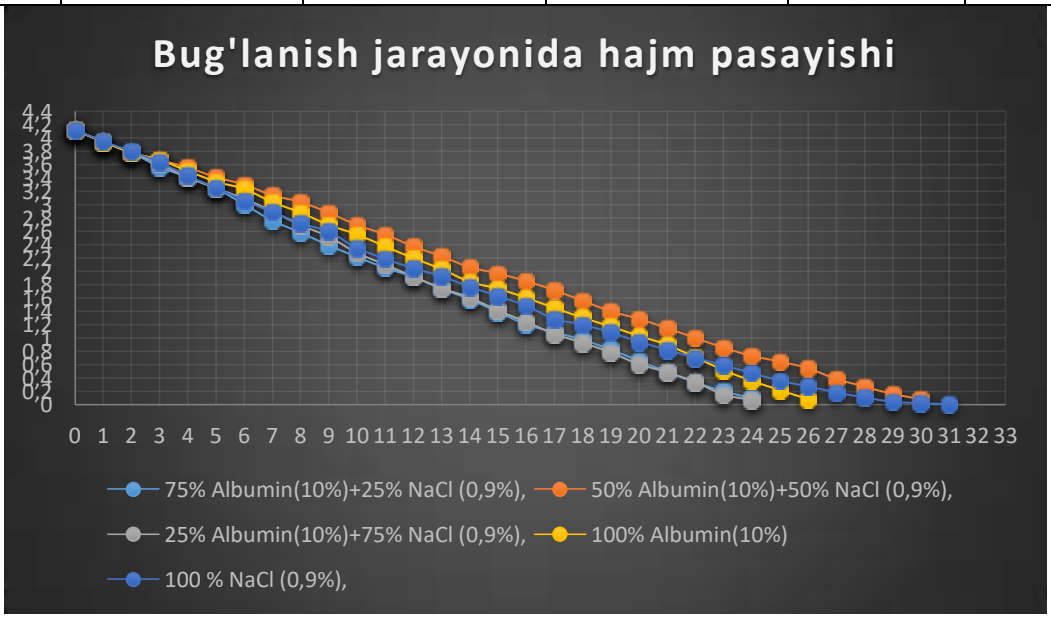
Our goal is to study the process of intermolecular composition, which occurs during the dehydration of biological fluids, depending on its composition, and provides information.

The object of the tests was biological fluid mixture of NaCl with a concentration of 0.9% and albumin (protein) liquids with a concentration of 10%, and using them, a mixture was created and taken as a sample.

Research results.

	25% NaCl (0.9%) + 75% Protein (10%)	50% NaCl (0.9%) + 50% Protein (10%)	75% NaCl (0.9%) + 25% Protein (10%)	100% Protein (10%)	100 % NaCl (0,9%),
0	4,124	4,124	4,124	4,124	4,124
1	3,948	3,948	3,948	3,948	3,955
2	3,786	3,786	3,786	3,786	3,802
3	3,571	3,674	3,615	3,674	3,64
4	3,415	3,562	3,415	3,51	3,438
5	3,251	3,415	3,251	3,349	3,256
6	3,008	3,307	3,094	3,24	3,068
7	2,766	3,145	2,904	3,044	2,894
8	2,585	3,044	2,7	2,885	2,725
9	2,394	2,885	2,524	2,7	2,599
10	2,222	2,7	2,282	2,557	2,354

11	2,057	2,557	2,106	2,379	2,192
12	1,922	2,379	1,926	2,202	2,05
13	1,744	2,231	1,752	2,039	1,929
14	1,586	2,066	1,61	1,847	1,773
15	1,396	1,972	1,417	1,744	1,634
16	1,21	1,859	1,248	1,608	1,488
17	1,09	1,719	1,066	1,456	1,293
18	0,979	1,565	0,933	1,31	1,205
19	0,831	1,405	0,789	1,178	1,089
20	0,663	1,292	0,611	1,035	0,949
21	0,497	1,152	0,492	0,904	0,827
22	0,341	1,006	0,344	0,715	0,708
23	0,203	0,86	0,157	0,523	0,593
24	0,106	0,736	0,076	0,363	0,481
25		0,651		0,222	0,364
26		0,551		0,087	0,278
27		0,389			0,188
28		0,276			0,112
29		0,164			0,047
30		0,089			0,026
31					0,011



Conclusions: Until recently, the concept of morphology in biology and medicine applied only to cellular tissues, and biological fluids (blood serum, tears, oral fluid (saliva), etc.) were outside the scope of morphological studies. However, the physical methods of studying biological fluids that have been developed in recent years have made it possible to change this relationship. It has been found that generally in biofluids there is an established order in the solid phase in the form of certain structures with relevant qualitative and quantitative parameters. At the same time, pathological

conditions of the body lead to significant disruption of this order. As a result, the structures acquire new properties that are considered as diagnostic features.

During the study of the process of dehydration of a drop of biological fluid, the study of its volume and surface changes was carried out for the first time in the experiment, and as a result, the substances contained in the biological fluid (saliva) (0.9% NaCl solution and 10% As a result of the change in the amount of protein in concentration), it was observed that the volume of the liquid decreases with time during dehydration, and the time of the dehydration process varies.

An important contribution of this work to science and practice is that it develops the principles of physico-mathematical approaches in clinical diagnostics, which not only complement the data of biochemical research, but also systematically allow to obtain fundamentally new diagnostic data.

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