

## **THE SCIENTIFIC ANALYSIS OF ZAMZAM WATER IN THE PERSPECTIVE OF HADITH PROPHET MUHAMMAD SAW**

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### **Abstract**

*This research is motivated by the rapid development of natural science and research conducted by scientists. We already know that Zamzam water is the best water on earth according to the hadith of the prophet Muhammad SAW. Therefore, the authors are interested in researching and examining more deeply about Zamzam water based on the hadith of the Prophet Muhammad and science. This research is a library research with primary data source in the form of Complete Hadith Index by Ahmad Zacky El-Syafa and supported by international journals. The data management technique uses qualitative data analysis, while the data analysis techniques and steps are to describe, collect and describe.*

**Keywords : Zamzam Water, The Scientific Analysis, The Hadith of Prophet Muhammad SAW.**

### **Abstrak**

Penelitian ini dilatarbelakangi oleh pesatnya perkembangan ilmu pengetahuan alam dan penelitian yang dilakukan oleh para ilmuwan. Kita sudah tahu bahwa air Zamzam adalah air terbaik di muka bumi ini menurut hadits nabi Muhammad SAW. Oleh karena itu, penulis tertarik untuk meneliti dan mengkaji lebih dalam lagi tentang air zamzam berdasarkan hadits Nabi Muhammad SAW dan ilmu pengetahuan. Penelitian ini merupakan penelitian pustaka dengan sumber data primer berupa Indeks Hadits Lengkap oleh Ahmad Zacky El-Syafa dan didukung oleh jurnal internasional. Teknik pengelolaan data menggunakan analisis data kualitatif, sedangkan teknik dan langkah analisis data adalah mendeskripsikan, mengumpulkan dan menguraikan. Dampak positif dari penelitian ini diharapkan umat muslim semakin teguh dalam memegang agamanya mengingat bukti-bukti otentik keagungan islam telah nyata dapat dibuktikan melalui sains dan hal-hal lain.

**Kata Kunci : 'Air Zamzam, Analisis Ilmiah, Hadis Nabi Muhammad SAW.**

## **A. Introduction**

The source of zamzam water is located in the Mecca area, one of the most sacred cities for muslims. This city is located in the western part of Saudi Arabia about 70 km south of the city of Jeddah on the coast of the Red Sea. Geographically it can be located at latitudes 21° 26` 48`` N, longitude 39° 53` 46``E, with an elevation of about 1399 ft, above mean sea level.<sup>1</sup> The word zamzam derived from Arabic language that is “Azzam zamu” which mean is abundant water.<sup>2</sup> Named Zamzam, in accordance with its meaning, because the water from the well so many and plentiful. Not exhausted though already taken and taken every day around the world by Muslims.

Zamzam are described in holy books of various religions, including the Tawrah/Torah, The Bible and the Qur’an, as narrated in these holy books, Zamzam is the holy water and is termed as a great gift from God. It is allegedly an offshoot from holy spring in the barren desert surrounding Mecca.

Long ago, holy prophet Ibrahim/Abraham with his wife (Hajar) and baby Ismail a.s came to Mecca. To fulfil God’s will, Prophet Ibrahim returned home, leaving Hajar and the infant in the desert. Soon afterward, the water that Prophet Ibrahim left with them ran out, and hajar was no longer able to breast-feed her child. Hajar became thirsty and so did her son, who started crying became unsettled due to extreme thirst. Hajar walked impatiently seven times between the hills of Al-Safa and Al-Marwa searching for water. After the seventh round, she heard the voice of the Angel Jabrail, who led her to a place where he kicked the earth and water emerged on the surface. She gathered water in her hands and collected it into a container, the water bubbled up again each time she scooped.<sup>3</sup>

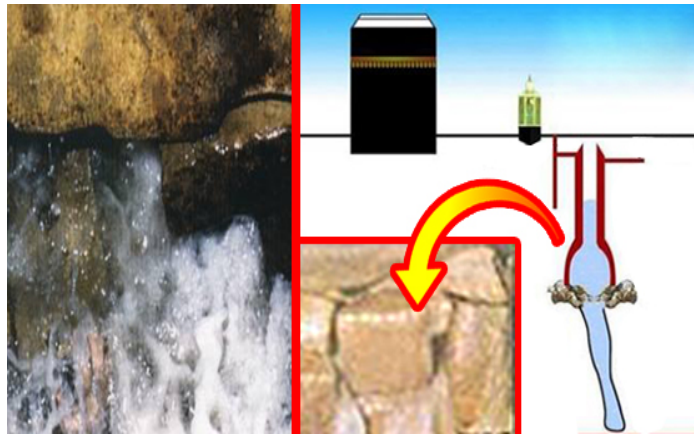
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<sup>1</sup> Al-Ganal, S.A Remarks on the Isotopic Composition of Holy Water of Zamzam, Mecca Area. In *World Enviromental Magazine*, World Envirment Group, 2008, 19-22.

<sup>2</sup> Ali Ma’shum, Kh. Zainal Abidin Munawwir, *Kamus Al-Munawwir Arab-Indonesia Terlengkap*, Yogyakarta, Pustaka Progresiv, Page 583.

<sup>3</sup> Ahmad, M.A.A.A; Ibrahim, M.S, *The Water of Zamzam*; Dar Al Taqwa Ltd: London, 1996; 8-51

## B. The Structure of The Well



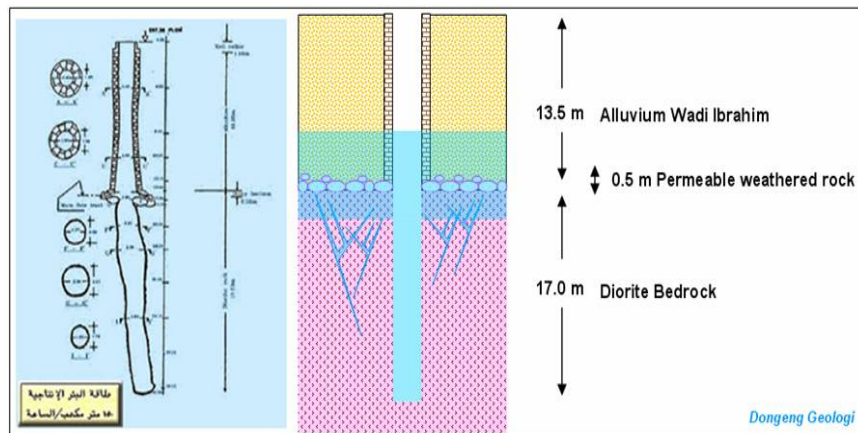
The Zamzam well is hand-excavated and is about 30.5 m deep, with an internal diameter ranging from 1.08 to 2.66 m. In hydrogeological terms, the well lies within the wadi Ibrahim, which runs through the Holy City of Mecca and taps ground water from the wadi alluvium, to a much lesser extent and from the underlying fresh bedrock. The well is now housed in a basement room, protected by glass panels that allow a clear view of the well. Electric pumps are used to draw water from the well, replacing the previous ropes and buckets. No visitors except dignitaries are allowed to enter the well room and its surroundings. Outside the room, there exists a service area, where cold Zamzam water fountains and dispensing containers are provided for drinking purposes. Recently, the Al-Haram Tawaf area has been extended to cover the entrance to this area and it is no longer accessible to pilgrims. Instead, cold zamzam water fountains and dispensing containers are now placed at the periphery of Tawaf area.<sup>4</sup>

Zamzam water is different from other water in many ways : first no bacteria can form at its source, second it doesn't go mouldy nor does it change colour, taste or smell.<sup>5</sup> Biological growth and vegetation usually take place in the most wells. This makes water unpalatable owing to the growth of algae leading to changes in taste and odour. However, in zamzam water well,

<sup>4</sup> SGS Zamzam, Saudi Geological Survey, <http://www.sgs.org.sa/English/Topics/Pages/Zamzam.aspx> Cited on April 25 2016.

<sup>5</sup> Koshak, Y H, (1983) Zamzam. Dar Alelm For Publications, Jeddah.

there isn't any sign of biological growth.<sup>6</sup>



The upper 13,5 m of the well is excavated in the sandy alluvium of the wadi Ibrahim and the lower 17 m in the underlying diorite bedrock. In between sandy alluvium and diorite bedrock., there is a thinner layer 0,5 m of permeable weathered rock. Most of the alluvial section of the well is lined with stone masonry, except for the uppermost 1 m, which has a reinforced concrete collar. The weathered rock section is lined with stone and provides the main water entry into the well.

From the pumping test of zamzam well is able to drain 11 – 18.5 liter/second, so per minute can be reached 660 liter/minute or 40 000 liter per hour.<sup>7</sup>

### C. The Scientific Analysis of Zamzam Water

*From Ibnu Abbas ra. that Rasulullah Saw said: “The best water in the world is zamzam water, because there are glut of eating and healing of the sick”.* (HR. Thabrani dan Ibnu Hibban).

*From Dzar ra. That Rasullullah Sawsaid: “Indeed Zamzam water contains a blessing. it also is a glut of food and healing for the disease”.* (HR Muslim, Ahmad, Abu Dawud dan Ath-Thayalisi).<sup>8</sup>

Based on the hadith above, the author will examine scientifically of

<sup>6</sup> Mashat, B H. The Microbiological Quality Of Sabil Free Drinking Water In Makkah Al-Mukarramah. JKAU : Met. Rnv. & Arid Land Agric.Sci. 2010; 21, 87-100.

<sup>7</sup> <http://www.dakwatuna.com/2013/05/26/33850/sumur-zamzam-mukjizat-fakta-sejarah-dan-khasiatnya/#axzz46qsxsnGp>. Cited on April 25 2016.

<sup>8</sup> Ahmad Zacky El-Syafa, *Indeks Lengkap Hadist*, Mutiara Media, Yogyakarta, 2012, Page 130-131.

the contained in the water of Zamzam according to scientific research that have been published in international journals. Kordy and Fonseka have reported that public water supply in Riyadh city was within the optimal range for dental health,<sup>9</sup> while Mohamed and Fattah reported fluoride levels of 0,26 – 0,43 ppm in the drinking water of Riyadh similar to the present findings where the fluoride level in Riyadh was found to be 0,28 ppm whereas the mean fluoride level collected from zamzam water from both well and pipe sources was 0,72 ppm and 0,68 ppm.<sup>10</sup> Respectively in accordance to the result obtained from the institute of the Custodian of the Two Holy Mosques for Al Hajj research centre in Om Al Qura university where they reported that the mean fluoride level in zamzam water was 0.6 ppm.<sup>11</sup>

**THE CHEMICAL ANALYSIS OF TAP AND ZAMZAM WATER**

Elements	Devices Used	Tap Water	Zamzam well	Zamzam pipe water
Na	Flame Photometer	37.8	133	135
Ca	Titration EDTA	75.2	96	96
Mg	Titration EDTA	6.8	38.88	38.88
K	Flame Photometer	2.7	43.3	43.2
HCO <sub>3</sub>	Titration Acid	70.2	195.4	195.4
Cl	Ion Chromatograph	73.3	163.3	159.7
Fl	Ion Chromatograph	0.28	0.72	0.68
NO <sub>3</sub>	Ion Chromatograph	2.6	124.8	126.1
SO <sub>4</sub>	Ion Chromatograph	107	124	123.3
PH	PH Meter	7.2	8	7.90
TDS	Oven 105°C	350	835	840

*Note : All values except PH are in mg/l*

<sup>9</sup> Kordy Mt Dan Fonseka C, Fluoride Concentration In Drinking Water In The Citi Of Riyadh, Saudi Med J 1984;5:336-8.

<sup>10</sup> Mohamed Zh and Fattah A. Fluoride and Carbonate/Bicarbonate Contents Of Drinking Water In Riyadh, Saudi Arabia. J Coll Science, King saud University, 1987;18: 151 – 9.

<sup>11</sup> Nour Al Zuhair and Rita Khounganian, A Comparative Study Between The Cemical Composition Of Potable Water And Zamzam Water In Saudi Arabia.

The role of fluoride in the prevention of dental caries is very well established. Since 1942, Dean et al reported an inverse relationship between caries prevalence and drinking water with different fluoride levels stating that exposure to water containing about 1 ppm fluoride in drinking water reduces caries experience by 50%.<sup>12</sup> Several other studies have reported a low caries experience with increasing level of fluoride concentration in drinking water.<sup>13</sup>

#### COMPARISON OF ZAMZAM, BOTTLED WATER AND DISTILLED WATER<sup>14</sup>

Parameter	Zamzam Water	Bottled Drinking Water	Distilled Water
Appearance	Clear	Clear	Clear
Odor	Acceptable	Acceptable	Acceptable
Turbidity	Nil	Nil	Nil
Suspended solids	Nil	Nil	Nil
Total Dissolved solids	1000	452	-
Ph	7.73	7.21	6.85
Conductivity	1390	7.40	0.5
Residual Chlorine	Nil	0.45	Nil
Total hardness	300	228	0.2
Calcium	220	136	0.1
Magnesium	80	92	0.1
Alkalinity (CO <sub>3</sub> )	Nil	Nil	Nil
Alkalinity (HCO <sub>3</sub> )	110	108	0.2
Chlorides	260	100	0.1

<sup>12</sup> Dean HT, Arnold FA and evolve E. Domestic Water and Dental Caries, V. Additional Studies Relation Of Fluoride Of Domestic Water To Dental Caries Experience In 4425 White Children Aged 12-14 Years, Of 13 Cities In 4 States. Public Health Reports 1942; 57:1155-1179.

<sup>13</sup> Angellillo I F, Torre I, Nobile CG et al. Caries and Fluorosis Prevalence In Communities With Different Concentrations Of Fluoride In Water. Caries Res 1996; 33: 114-122.

<sup>14</sup> El-Zaiat, S.Y. *Inherent Optical Properties of Zamzam Water in The Visible Spectrum: Dispersion Analysis*. The Arabian Journal For science and Engineering 2007, 32(2A), 171-180.

Floride	0.59	0.32	0.1
Sulfates	180	-	Nil
Nitrates	31.6	-	10
Phospate	0.15	0.13	-
Ammonia	0.11	0.06	Nil
Iron	0.06	0.05	Nil
Copper	0.04	-	-
Silica	37.6	11.3	-

Calcium is the most abundant and the most important mineral in the body, yet it is the most difficult to get absorbed and utilized by the cells. It raises the body's resistance to viruses, parasites, cancer as well as bacteria which causes tooth decay. Calcium naturally occurs as a compound molecule. When calcium is in a compound form, magnesium and vitamin D increase its absorption. Sodium helps keep calcium in soluble form in the body. To be usable in the body, calcium must be water-soluble. The human body needs water soluble calcium with water soluble magnesium. If your body does not have about two parts magnesium for every onepart calcium, the calcium becomes pollution for the body while magnesium helps keep bone from becoming brittle.<sup>15</sup>

The result of the water samples tested by the European laboratories showed that zamzam water has a special physique that makes it advantageous water. The main differencebetwenen zamzam water and other water was in the quantity of calcium and magnesium salts, the content of these was slightly higher in zamzam water, but more significantly, the water contains fluorides thathave an effective germicidalaction. Moreever, the remarks of the European laboratories showed that the water was fit for drinking.<sup>16</sup>

Water having high level of calcium and magnesium protect human body against Cardiovascular Disease (CVD) and cancer of Oesophagus

<sup>15</sup> Ramer T. Animal Protein Cause Calcium Leached From The bones. Am J Clin Nut. 1994;59 : 1356 - 61

<sup>16</sup> Analytical Report of Zamzam Water Cited from The Annual Report of The Ministry Of Agriculture And Water Resources 1971.

Pancreas Breast and rectum.<sup>17</sup> Drinking zamzam water can produce some effect on human body as it has desired concentration of calcium and magnesium. Although, we are all agreed that sodium is essential for normal human life, there is daily requirement about sodium intake, however, total daily consumption of 120-400 mg will meet the daily requirements of sodium for growing infants and youngchildren and for adults 500 mg. No health-based guideline value is therefore available. However, sodium may alter the taste of drinking-water at levels above about 200mg/litter, while in zamzam water sodium concentration is satisfactory.

#### **D. Effect of Zamzam Water on Blood Pressure**

*From Jabir ra. Rasulullah Saw said: "The water of zamzam dependent on their intention of drinker. Who was drank of zamzam water for healing of diseases, undoubtedly God will healing the diseases or jounce hunger, undoubtedly God will make it full. And for the utility, undoubtedly God will filled it". (HR Al-Mustaghfiri)*

*Rasulullah Saw said: "Zamzam water is cure of all the diseases". (HR Ad-Dailani)<sup>18</sup>*

Based on these hadith above, zamzam water is the cure of all the diseases. Therefore, the author will analyze scientifically the benefit of zamzam water. Twenty patients of hypertension was selected keeping all conditions constant like their diet for 10 patients instead of simple tap water zamzam was provided for 30 days while other 10 patients was drinking mineral water there was significant decrease in blood pressure for those 10 patients which use zamzam water is slightly alkaline in nature. Effect of zamzam water was may be due to presence of high concentration of calcium.

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<sup>17</sup> Yasui, M. K. Ota and M. Yoshida, 1997. Effect of Low Calcium and Magbesium Dietary Intake On The Central Nervous System Tissues Of rats And Calcium-Magnesium Related Disorders In The Amyotrophic Lateral Sclerosis Focus In The Kii Peninsula Of japan. *Magnes. Res.* 10 : 39-40.

<sup>18</sup> Ahmad Zacky El-Syafa, *Indeks Lengkap Hadist*, (Mutiara Media, Yogyakarta, 2012), Page 131.



**Effect of Zamzam Water On Blood Pressure**

No	Patient Name	Blood Pressure	Average Blood Pressure After 30 Days
1.	Gulzarbibi	150/90	130/80
2.	Muhammad Mushtaq	150/100	140/90
3.	Salma Bibi	140/80	120/80
4.	Haleema bibi	140/100	130/95
5.	Zaib-un-nisa	160/100	130/80
6.	Abdul Qayyum	150/90	130/80
7.	Shameem bibi	170/100	140/190
8.	Azrakhatoun	130/90	120/85
9.	Nor Khan	150/90	130/80
10.	Farkhanda	160/100	130/80

**Effect of Mineral Water on Blood Pressure<sup>19</sup>**

No	Patient Name	Blood Pressure	Average Blood Pressure After 30 Days
1.	Aniqasaher	170/100	150/100
2.	Gudo	150/90	150/90
3.	Muhammad Munir	160/90	155/95
4.	Muhammad Aqeel	140/80	140/80
5.	Farzana	150/100	140/100
6.	Anilabibi	160/80	150/80
7.	Imran	130/90	140/90
8.	MehwishBibi	140/90	150/90
9.	ShakeelaBibi	160/90	160/80

<sup>19</sup> Munir N, Shoaib M, Asad MJ, Tanooli AY, Munir N and Sherwani SK, (2015), "Physio-Chemical Differences Between Aab-E-Zamzam And Mineral Water Effect Of Water Intake on Blood Pressure", American-Eurasian Journal of Toxicological Sciences, 7 (2) : 83-87.

10.	Muhammad Saleem	150/100	150/90
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Based on the table above, zamzam water contains high concentration of calcium that reduce the risk of low birth rate and it lowers the blood pressure. Zamzam water in purification and chemical composition is better than mineral water.

### **Zamzam Water and Stimulation of Reproductive System**

Zamzam water was used in the treatment of implantation failure, for stimulation of endometrial prolactin,  $\alpha$  and  $\beta$  defensin, luteinizing hormone (LH), endometrial vascular endothelial growth factor (VEGF), and angiopoietin receptors.<sup>20</sup> Furthermore, zamzam water cause upregulation of gap junctional inter-cellular communication and connexin 43 antibodies in endometrium. Recently, Ali et al demonstrated that zamzam water stimulates stem cells differentiation in the endometrium. This phenomon is triggered due to the high calcium and magnesium content of zamzam. Also, the water provides more support to many other biochemical processes in the endometrium, including its vital role as coenzyme during the formation of immunoglobulin.<sup>21</sup> Zamzam stimulates the formation of implantation windows through stimulation of AQPs because it contains high contents of fluorides, contributing to its strong antimicrobial action. Zamzam water also acts as an antioxidant as it stimulates endometrial nitric oxide (NO). it also stimulates endometrial brain derived neurotrophic factor (BDNF).

### **Zamzam Water and Dental Caries**

A comparative study between zamzam waterand other sources of water on the prevalence of dental caries and their severity in school girls was carried out by Al-Zuhair and Khounganian.<sup>22</sup> Clinical examination revealed

<sup>20</sup> Ali, A.F.M.; Hassain, M.; El Hosani, A. Zamzam Water a New Modality ForFailed Repeated Intra Cytoplasmic Sperm Injection. In: *13<sup>th</sup> International Water Technology Conference, IWTC: Hurghada, Egypt, 2009.* 1557-1560.

<sup>21</sup> Ali, A.F.M.; Rafik, M.; Ali, S.M.; Hussein, M.; Hassan, A.; El Hussein, A.; Farid, L. Treatment of Cervical Insufficiency Abortion by Zamzam Water Activated Autologous Human Peripheral Blood Mononuclear Cell, Modern trend. In; *13<sup>th</sup> International Water Technology Conference, IWTC: Hurghada, Egypt, 2009.* 1533-1541.

<sup>22</sup> A-Zuhair, N.A.; Khounganian, R. *A Comparative Study between The Chemical*

that, in the mixed dentition group, no statistical significant differences were detected, whereas among permanent dentition group, the mean decayed, missing, filled teeth (DMFT) score was the lowest in all the children using zamzam water. The role of fluoride in the prevention of dental caries is very well established.

### **Zamzam Water and Cancer**

Dietary guidelines around the world recommend increased consumption of plant foods to combat chronic diseases such as cancer, cardiovascular diseases, diabetes, and osteoporosis.<sup>23</sup> Zamzam water has unique oncolytic properties and has a strong anti-inflammatory effect. Zamzam water has a strong antitumor necrosis factor (TNF $\alpha$ ) and effect on interleukin I (IL1).<sup>24</sup> Zamzam water has oncolytic action through an indirect influence on endocrine immunology and the growth system of the body. Initially, it was observed in an experimental mice model.<sup>25</sup> To study the oncolytic action of Zamzam water, the experimental mice were injected with azoxymethane (AOM).<sup>26</sup> To induce a colon tumor. Biopsies were taken from the non-tumor tissue to prepare microarray data for differentially expressed genes. Experimental mice were fed with 500 cc zamzam water daily for one month, and again a biopsy was taken after zamzam water intake. A significant ( $P < 0.05$ ) reduction in the tumor size was observed that finally diminished in long-run study. One possible reason for the disappearance of the tumor is the biochemical nature of zamzam water.

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*Composition Of Potable Water and Zamzam Water And Its Effect On Tooth structure in Saudi Arabia . Saudi Dental Journal 2006, 18 (SI), Abs. 071.*

<sup>23</sup> Rao, A. V.; Ali, A. *Biologically Active Phytochemicals in human health: Lycopene. International Journal Of Food Properties* 2007, 10 (2), 279-288.

<sup>24</sup> Ali, A.F.M.; Coesmi, E.; Kamel, S.; Mohammed, S.; Elhefnawy, M.; Farid L.; Shaker, S. Zamzam Water Gene Downregulation in Uterine Fibrochondrosarcoma Cell Line. In: *13<sup>th</sup> International Water Technology Conference, IWTC: Hurghada, Egypt, 2009.* 1543-1547.

<sup>25</sup> Ali, A.F.M.; Coesmi, E.; Kamel, S.; Mohammed, S.; Elhefnawy, M.; Farid L.; Shaker, S. Oncolytic action of zamzam Water on Azoxymethane (AOM) induced colon tumors in rats. In: *13<sup>th</sup> International Water Technology Conference, IWTC: Hurghada, Egypt, 2009.* 1521-1526.

<sup>26</sup> Hakkak, R.; Korourian, S.; Ronis, M.J.; Johnston, J.M.; Badger, T.M. *Soy protein Isolate Sumption Protects Against Azoxymethane-Induced colon Tumors in Male rats.* *Cancer*

### **Tumor size, Lymphocytes and Somatostatin Before and After Zamzam Water Intake**

	Before Zamzam Water Intake	After Zamzam Water Intake	<i>P</i> Value
Tumor Size	3.1	1.5	< 0.05
Number of Lymphocytes	101	688	< 0.05
Serum Somatostatin	3.3	18.2	< 0.05

### **Crystallography of Zamzam Water**

Emoto's hypothesis has evolved over the years of his research. Emoto claimed that high-quality water forms beautiful and intricate crystals, while low-quality water has difficulty forming crystals. According to Emoto, an ice crystal of distilled water exhibits a basic hexagonal structure with no intricate branching and positive changes to water crystals can be achieved through prayer, music or by attaching written words to a container of water. Emoto published several volumes of a work titled *Messages from Water*, which contains photographs of water crystals next to essays and words of intent.

Recently, quantum biophysical semeiotics experiments have offered new evidence about the existence of a connection between water memory and healing information, exactly following Emoto's interesting hypothesis about the changes to water crystals achieved by music and songs.<sup>27</sup> Emoto passed different sound frequencies through zamzam water and observed variable crystal behavior based on crystallography technique among zamzam water and water samples from other parts of the world. Interestingly, he noticed that this water had a special interaction and reaction when the words of Allah in the Qur'an were recited to it. Emoto brought a few drops of zamzam water and

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letters 2001, 166, 27-32.

<sup>27</sup> Stagnaro, S. Quantum Biophysical Semeiotics Evidences of water-memory-information by means of musics energizing action: Caramel's experiment. *Journal of Quantum Biophysical Semeiotics* [http://www.sisbq.org/uploads/5/6/8/7/567930/twoprayers\\_2011.pdf](http://www.sisbq.org/uploads/5/6/8/7/567930/twoprayers_2011.pdf) (Accessed Februari 25, 2016).

recited the “Bismillah” in Arabic and noticed a unique arrangement of the water particles in shape. He observed the water particles taking distinct shape in comparison with other water particles shape taken from other water of the world. Emoto was not able to crystallize zamzam water even after diluting zamzam by 1000 times. However, he got uniquely shaped crystal after freezing.<sup>28</sup>



<sup>28</sup> Emoto, M. Love Thyself: Messages From Water. Vol. 3.50-51. HADO: Kyoikusha,

## **E. Conclusion**

A lot of benefits of zamzam water have been elucidated by journals and researchers. This study has provided an essential base-line data regarding the analysis of the chemical composition of zamzam water, Bottled Drinking Water and distilled water. Zamzam water from both sources (well and pipes) have proven to contain high levels of fluoride. Zamzam water contains high concentration of calcium that reduce the risk of low birth rate and it lowers the blood pressure. Zamzam water has a special interaction and reaction when the words of Allah in Al-Qur'an were recited and got a uniquely shaped crystal.

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