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Research Article

Laboratory Studies of Colloidal Silver Life Water as Homeopathic Support Remedy

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Abstract: ***Aim:*** This current paper examines the laboratory analysis of the first study on both safety and toxicity of colloidal silver life water manufactured by Edigaf Services in Ghana as homeopathic remedy. ***Method:*** The research institution, Kwame Nkrumah University of Science and Technology (KNUST), Ashanti region, Ghana conducted an extensive investigations into the product. Different departments of the University conducted different analysis. The Department of Pharmacology conducted two different tests. In the first test, twenty animals were divided into two groups, control (n=10) and test animals (n=10). The control received ad libitum of normal tap water while the test group was provided with Silver life water. Both groups were given normal rodent feed (Agricare Ltd, Kumasi, Ghana). Water bottles (300 ml) were refilled as and when needed. Animals were then observed daily for 5 days for signs of toxicity. In the second test, rats were divided in 3 groups (n=5) and treated with 0, 5 ml/kg and 8ml/kg of the test water (Silver life) and observed over 48 hours for signs of toxicity. In the third test, the Department of Theoretical and Applied Biology/Environmental Science and Chemistry for microbiological and physicochemical analysis also compared the bacterial numbers and physicochemical properties of **Silver Life Water** and **Raw Water** in the laboratory. ***Result:*** In the first test, none of the animals died during the study period. There were also no signs of toxicity attributable to the water under study. In the second test, none of the animals died during period and no signs of toxicity attributable to the test water treatment were observed. The lethal dose (LD50) of the water was estimated to be above 8 ml/kg. The microbiological report revealed that the Silver Life Colloidal Water is of **VERY GOOD QUALITY** and that of the Raw water was equally good. Both product samples are microbiologically **SAFE** for drinking**.** They conform to WHO Guidelines and Ghana Standards (GS) 175-1:2009. The physicochemical properties report also proved that, the Raw water and the Silver Life Colloidal Silver Water samples both meet the physicochemical quality requirements for drinking water based on the WHO and Ghana Standards GS 175-1: 2009 for drinking water quality parameters. ***Conclusion:*** The results indicate that Silver life Water can be regarded as virtually non-toxic in rats when given ad libitum for 5 days. The LD50 is also estimated to be above 8 ml/kg body weight of rats. The Colloidal Silver Life Water is safe in the Laboratory according to WHO Guidelines and Ghana Standards for drinking water quality. The product, silver Life Water could therefore be used as a homeopathic medicine in Ghana by alternative medicine Practitioners. This is the first research in Ghana that proved that silver water is safe in the laboratory.

Keywords: Homeopathic, Antibiotic, Colloidal silver, Silver Life Water, Raw Water.

INTRODUCTION

The physicochemical properties of a drug govern its absorptive potential, but the properties of the dosage form (which partly depend on its design and manufacture) can largely determine drug bioavailability according to purestcolloids.com.

Absorption rate is important because even when a drug is absorbed completely, it may be absorbed too slowly to produce a therapeutic blood level quickly enough or so rapidly that toxicity results from high drug concentrations after each dose. The plasma drug concentration increases with the extent of absorption; the peak is reached when the drug elimination rate equals absorption rate.

The research on colloidal silver water safety is mixed with FDA issuing several warnings against products with silver. According to Gnat Ignatov and Oleg Mosin 2015, Silver (Ag) –is a metal with an atomic mass of 107.87 a.u.e. related to the sub-group of

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the first group of the periodic system of D.I. Mendeleev, has a pronounced physiological effect on the body, and is resistant to atmospheric oxygen at room temperature.

Hans Laroo 2013, also postulates that Colloidal silver consists of loose silver atoms forced by the tensions of the water to adhere into clusters in suspension. Accordingly, to refer to Nano sized colloidal silver clusters as being metallic, is incorrect.

The heavy metal content of colloidal silver has been a major subject of the toxicity studies. The big question is whether silver is a heavy metal, what is the right dosage and will product of such nature have a long term effect on humans?

METHODOLOGY

Six (6)samples of the Colloidal Silver Water in an 750ml Brown Plastic Bottle were sent to the Kwame Nkrumah University of Science and Technology, KNUST, Ashanti region, Ghana to the Department of Pharmacology for toxicological analysis. This is in line with the FDA in Ghana requirement of product registration.

Two tests were carried out. In the first test, twenty animals were divided into two groups, control (n=10) and test animals (n=10). The control received ad libitum of normal tap water while the test group was provided with Silver life water. Both groups were given normal rodent feed (Agricare Ltd, Kumasi, Ghana). Water bottles (300 ml) were refilled as and when needed. Animals were then observed daily for 5 days for signs of toxicity.

In the second test, rats were divided in 3 groups (n=5) and treated with 0, 5 ml/kg and 8ml/kg of the test water (Silver life) and observed over 48 hours for signs of toxicity.

DEPARTMENT OF PHARMACOLOGY
TOXICOLOGICAL REPORT
NAME OF SAMPLE: Silver Life
BATCH NO: 083662626

Table 1 Acute Toxicity

Animal Species	**No. of animals/group**	**Route of administration**	**Doses administered**	**No. of death recorded**	**Duration of study**
Sprague Dawley Rats	20 males, 2 groups (n=10)	Oral	*ad libitum*	No deaths recorded	5 days

Table 2 Acute Toxicity

Animal Species	**No. of animals/group**	**Route of administration**	**Doses administered**	**No. of death recorded**	**Duration of study**
Sprague Dawley Rats	15 males, 3 groups (n=5)	Oral	0, 5 ml/kg, 8 ml/kg	No deaths recorded	48 h

RESULT

In the first test, none of the animals died during the study period. There were also no signs of toxicity attributable to the water under study (Table 1).

In the second test, none of the animals died during period and no signs of toxicity attributable to the test water treatment were observed. The lethal dose (LD_{50}) of the water was estimated to be above 8 ml/kg (Table 2).

CONCLUSION

The results indicate that ***Silver life*** can be regarded as virtually non-toxic in rats when given *ad libitum* for 5 days. The LD_{50} is also estimated to be above 8 ml/kg body weight of rats.

1. MICROBIOLOGICAL ANALYSIS

Table 3: Bacterial number in SILVER LIFE COLLOIDAL SILVER Water and Raw Water Sample

Sample Identification	**Faecal coliforms (cfu 100ml^{-1}) Method:** APHA 922D	**Escherichia coli (cfu 100ml^{-1}) Method:** APHA 922D	Streptococcus **(cfu 100ml^{-1}) Method:** APHA 922D	**Total Heterotrophic Bacteria (cfu 1m1^{-1}) Method:** APHA 9215B
Colloidal Silver Water	0	0	0	0
Raw Water	0	0	0	1

Ghana Water Standards GS 175-1:2009	**0**	**0**	**0**	**Max. 10^5 to 10^6**

Tab 4

Sample Identification	**Total coliforms (cfu 100ml^{-1}) Method:** APHA 922D	Sulfite Reducing Bacteria **(cfu /100ml) Method:** APHA 4500E	*Pseudomonas* **(cfu 100ml^{-1}) Method:** APHA 9213E
Colloidal Silver Water	0	0	0
Raw Water	0	0	0
Ghana Water Standards GS 175-1:2009	0	0	0

The colloidal silver Life Water if of very good quality compared to Raw per the analysis and microbiologically safe (**Tab 4**). Also the colloidal Silver life water contained no Total Heterotrophic Bacteria (cfu 1m1-1) as compared to the Raw Water which contained 1(**Tab 3**)

Physicochemical properties of SILVER LIFE COLLOIDAL SILVER Water and Raw Water samples

Tab 5

	Colloidal Silver Water	**Raw Water**	**Ghana Water Standards GS 175-1:2009**
pH	8.50	7.23	**6.5-8.5**
Total Dissolved Solids (TDS) mg I^{-1}	0.05	0.10	**1000**
Carbonate Hardness (mg I^{-1})	100.00	26.00	**200**
Total Hardness (mg I^{-1})	8.20	13.03	**500**
Magnesium Hardness (mg I^{-1})	2.20	4.28	**N/A**
Aluminum Hardness (mg I^{-1})	0.01	0.19	**0.2**
Colour (HV)	1.00	1.23	**15 TCU**
Turbidity (NTU)	0.10	0.14	**5 NTU**
Calcium (mg I^{-1})	0.06	0.15	**40**
Magnesium (mg I^{-1})	0.02	0.08	**N/A**
Sodium (mg I^{-1})	1.08	4.87	**200**
Potassium (mg I^{-1})	0.44	0.53	**N/A**
Chloride (mg I^{-1})	28.40	28.69	**250**
Sulphate (mg I^{-1})	7.00	10.00	**250**
Bicarbonate (mg I^{-1})	122.00	36.44	
Phosphate (PO_4) (mg I^{-1})	0.01	0.07	**N/A**
Alkalinity (mg I^{-1})	100.00	26.00	**200**
Antimony (mg I^{-1})	Nil	Nil	**0.02**
Arsenic (mg I^{-1})	Nil	Nil	**0.01**
Barium (mg I^{-1})	Nil	Nil	**0.70**
Borate as Boron (mg I^{-1})	Nil	Nil	**0.50**
Cadmium (mg I^{-1})	Nil	Nil	**0.003**
Chromium (mg I^{-1})	Nil	Nil	**0.05**
Cyanide (mg I^{-1})	Nil	Nil	**0.07**
Sulphide (mg I^{-1})	Nil	Nil	**N/A**
Fluoride (mg I^{-1})	0.05	0.14	**1.50**
Lead (mg I^{-1})	Nil	Nil	**0.01**
Manganese (mg I^{-1})	0.004	0.008	**0.40**
Mercury (mg I^{-1})	Nil	Nil	**0.006**
Nickel (mg I^{-1})	Nil	Nil	**0.07**
Total Iron (mg I^{-1})	0.09	0.26	**1.00**
Nitrate (mg I^{-1})	0.06	0.10	**50.00**
Nitrite (mg I^{-1})	0.03	0.06	**3.00**
Residual Free Chlorine (mg I^{-1})	0.02	0.09	**0.50**
Selenium (mg I^{-1})	Nil	Nil	**0.01**
Suspended Solids (SS) (mg I^{-1})	Nil	Nil	**N/A**

RESULT

The Raw water and SILVER LIFE COLLOIDAL SILVER Water samples both meet the physicochemical quality requirements for drinking water based on the WHO and Ghana Standards GS 175-1:2009 for drinking quality parameters.

CONCLUSION

The author of this research paper reports that colloidal silver life water manufactured in Ghana is safe for public consumption as homeopathic product in moderation.

Conflict of Interest

The author of this paper reports no conflict of interest

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REFERENCE

1. Ignatov, I., & Mosin, O. (2015). Studying the Properties of Microdispersed Colloid Silver Nanoparticles. *Journal of Medicine, Physiology and Biophysics*, *10*, 18-28.
2. Laroo, H. (2013). Colloidal nano silver-its production method, properties, standards and its bio-efficacy as an inorganic antibiotic. *J Phys Chem Biophys*, *3*(5), 100130.
3. Safety and Toxicity of Colloidal Silver · Sovereign Silver To be accessed at https://sovereignsilver.com › Silver101
4. Wen, L. S., Santschi, P. H., Gill, G. A., Paternostro, C. L., & Lehman, R. D. (1997). Colloidal and particulate silver in river and estuarine waters of Texas. *Environmental science & technology*, *31*(3), 723-731.
5. Is Colloidal Silver Healthy & Safe or Just Hype? | Wellness Mama. https://wellnessmama.com › Blog › Health Mar 25, 2019 –
6. Maneewattanapinyo, P., Banlunara, W., Thammacharoen, C., Ekgasit, S., & Kaewamatawong, T. (2011). An evaluation of acute toxicity of colloidal silver nanoparticles. *Journal of Veterinary Medical Science*, 1106220557-1106220557.
7. Lansdown, A.B.G. (2010). Advances in Pharmacological Sciences. A Pharmacological and Toxicological Profile of Silver as an Antimicrobial Agent in Medical Devices. Published online 2010 Aug 24. doi: 10.1155/2010/910686
8. Colloidal Silver Toxicity Study | Purest Colloids. Availablehttps://www.purestcolloids.com/toxicity.php