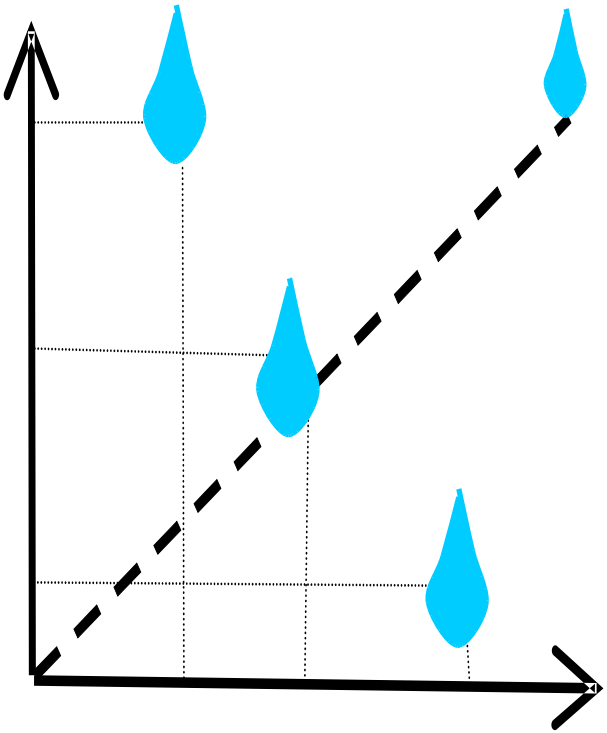
HOMEOPATHY AND WATER

Volume 1

1ST Edition



Federal University of Viçosa
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HOMEOPATHY AND WATER

Volume 1

Experimental results on water treatment with high dilutions

Federal University of Viçosa
Center for Agricultural Sciences
Department of Plant Science

Viçosa- MG
Brazil
2012

HOMEOPATHY AND WATER

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Federal University of Viçosa
Center for Agricultural Sciences
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HOMEOPATHY AND WATER

Volume 1

Experimental results on water treatment with high dilutions

Results and interpretations on phenomena of high dilutions by the principles of Homeopathy.

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HOMEOPATHY AND WATER

GRATEFULNESS

To God, present at all times.

To Hahnemann, for the valuable science of Homeopathy.

To Agricultural Family, for the wisdom and simplicity.

To the students of Homeopathy, for their dedication.

To Federal University of Viçosa and Department of Plant Science, for their support.

To our family relatives for their love.

To our friends, for their confidence.

HONORABLE MENTION

CNPq (Brazilian Council for Scientific and Technological Development).

CONAHOM (National Council of Homeopathy)

UNESCO and Brazil Bank Foundation

DEDICATION

To Agricultural Families.

To Earth.

To Water.

HOMEOPATHY AND WATER

CONTENTS

HOMEOPATHY AND WATER

PREFACE

This book was proposed to be a collection of scientific works. Experimental data were collected by undergraduate and graduate students. The organizers of this volume 1 understood that those students deserve more attention and encouragement. They made efforts in order to work in the laboratories. The organizers hope that the readers understand this proposal.

In volumes 3 and 4 the readers will find dissertations results (master) and thesis results (doctoral) all defended and summarized.

The purpose of this book, a serial publication, is to disclosure original experiences with highly diluted and succussed preparations interpreted by the principles of Homeopathy looking forward basic knowledges about the responses of water to homeopathic treatments.

The researches in Homeopathy are initiated by pathogenesis studies of the high diluted substances. Pathogenesis is the set of signals from trials with healthy organisms subjected to applications of homeopathic preparations. So, they are signs, not symptoms. These signs are classified, organized, building the “Homeopathic Acology” or “Homeopathic Acognosy”, old terms, but scientific terms, to replace the older term “Homeopathic Medical Matter” (Materia Medica).

This publication aims at the research on applications of Homeopathic principles to the treatment of water. It is a pioneering publication that will contribute to the development of technologies that could be sustainable, biologically advanced, and may allow water treatment in rural or urban areas.

The water, because of its chemical constitution and its biological value is a challenge to scientists. The meaning of its physic structure should be the center of attention of *Homo sapiens* intended to have descendants in time and space.

Homeopathy is understood as a natural resource or an advanced knowledge of capability to transform the state of life on Earth, from polluted or diseased, to healthy, well balanced, ordered, biologically and marketly adjusted, by changing people and their surroundings.

This is a book of new experiences, and of contributions to “Homeopathic Acognosy” or “Homeopathic Acology”.

CHAPTER 1

EFFECTS OF *Alumina* IN SOIL SOLUTION

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Fernanda Maria Coutinho de Andrade[3]
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Keywords: Homeopathy. High Dilutions. Water Treatment.

Introduction

The water and the intrinsic physico-chemical properties are the key role in the life of the soil. The soil is considered porous matter, with part of the spaces full of aqueous solution. Soil solution reactions are important for plant development (MIRANDA et al., 2006). The main characteristic of Brazilian soils is the high acidity, due to concentrations of iron, manganese and also due to aluminum toxicity in soil solution.

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The importance of water and soil solution studies is related to the fact that plants absorb the nutrients that are in this solution. Soil solution is analyzed as far as local acidity (BRANDÃO & LIMA, 2002). The degree of soil acidity is expressed in pH unit, which is related to the concentration of H + ion in the soil solution. The pH increases as the concentration of H + ion is increased.

The pH of the water and of the soil solution is an important indicator of soil acidity, for interfering with the availability of chemical elements which are essentials to plant growth, so, as a function of pH, elements are released from the soil or not (BRANDÃO & LIMA, 2002). The inadequate management of water, soil, fertilizers and pesticides, coupled with the discharge of untreated effluent into rivers and lakes, have deteriorated the quality of surface waters and consequently, of soil solution, bringing damages to environmental quality and plant development (QUIAN et al., 1994).

It is a common practice in rural areas to reduce soil acidity with lime, by adding lime prior to plant season. The components of limestone (CaCO3 and MgCO3) react with the H + ions, increasing the pH of the soil solution. Alternatively, it is been used homeopathic preparations, especially *Alumina*. This practice is quite common among farmers who adopt the principles of homeopathic science aiming health of their agroecosystems (CNPq, 2007). Despite being part of the routine of some agroecological farmers, the use of *Alumina* in order to adjust soil pH has not been studied scientifically. There are few scientific studies that may confirm the hypothesis that *Alumina* promotes pH increase in the soil solution. Homeopathy is being understood as the science of high dilutions and a treatment procedure which is available to

all living systems (CASALI et al., 2006).

The choice of the homeopathic preparations to be given to not-healthy organisms is guided by the principle of similarity. The pathogenesis signs (Homeopathic Acognosy) of the substance that are of greater similarity to the symptons determines the curative homeopathic procedure (LISBOA et al., 2005).

Basic preparation (tincture) of *Alumina* is obtained from aluminum oxide. The *Alumina* is indicated for cases of acidity in living systems also for organisms with slow metabolic processes often associated to high levels of aluminum intoxication. *Alumina* promotes the reaction and bring into harmony these living systems (CASALI et al., 2009).

The objective of this research was to evaluate the effect of five *Alumina* potencies on acidified solution of soil.

Materials and Methods

The experiment was carried out at the Laboratory of Homeopathy for Soil and Water, Department of Plant Science, Federal University of Viçosa (Brazil), in 2011.

The experimental design was the completely randomized of six treatments (*Alumina* 3CH, 5CH, 7CH, 11CH, 9CH and distilled water as control), four replicates, and 24 experimental plots. The homeopathic solutions were prepared in distilled water few minutes before the initiation of treatments. The mechanical arm machine performed the 100 succussions.

In preparing the soil solution, the green clay sample was diluted in demineralized water. After 24 hours, the overnatant

was collected. This liquid was adjusted to pH 4.0 with the addition of HCl, resulting in the acid soil solution.

In twenty-four borosilicate vials, of 80 mL with 60 ml of acidified soil solution were applied five drops of treatments, a single dose application.

The pH was evaluated through the potentiometer, DM-21. The electrode was washed off by distilled water after each reading. The pH was measured immediately after treatment (pH-T1), after 24 (pH-T2), after 48 (pH-T3) and after 96 hours (pH-T4) of treatments application. The data were processed statistically by analysis of variance in the program SAEG 9.1 (1997). The means were compared by Tukey test at 5% probability.

Results and Discussion

The soil solution was responsive to treatment. There were pH changes statistically significant after application of homeopathic preparations (Table 1).

Table 1 - Analysis of variance of pH data immediately after treatment (pH T-1), after 24 hours (pH T-2), after 48 hours (pH T-3) and after 96 hours (pH T-4) of *Alumina* application in the soil solution. Viçosa-MG. 2011.

Source of Variation	**DF**	**Mean Square**			
		pH T-1	**pH T-2**	**pH T-3**	**pH T-4**
Treat.	5	0.0057*	0.044**	0.065**	0.231**
Res.	18	0.0015	0.0063	0.0080	0.0084
VC (%)		0.87	1.73	1.85	1.79

*-significant at 5% by F test
**- significant at 1% by F test
VC-Variation Coefficient DF- Degrees of freedom

After 24 hours of applications there was a reduction in the pH of solution. However, after 96 hours of application, all potencies caused statistically significant increases in pH, as compared to control.

Table 2 - Mean of pH values immediately after treatment (pHT-1), after 24 hours (pH T-2), after 48 hours (pH T-3) and after 96 hours (pH T-4) of *Alumina* application in the soil solution. Viçosa-MG. 2011.

Treatments	**pH T-1**	**pH T-2**	**pH T-3**	**pH T-4**
Control	4.40B	4.72AB	4.065C	4.77C
Alumina 3CH	4.45AB	4.55BC	5.025A	5.35A
Alumina 5CH	4.45AB	4.50C	4.82ABC	5.05B
Alumina 7CH	4.47AB	4.75A	4.75BC	4.95BC
Alumina 9CH	4.50A	4.60ABC	4.90AB	5.32A
Alumina 11CH	4.50A	4.52C	4.85ABC	5.32A

Means followed by the same letter, in column, do not differ at 5% probability by Tukey test.

The addition of HCL to acidify the soil solution was done with the objective to imbalance the solution. Thus, treatment results should be interpreted as an *Alumina* stimulation to soil solution in order to react forward its intrinsic and natural equilibrium.

According to Andrade (2004), the homeopathic preparation *Alumina* when applied to acid soil increases the respiratory activity of soil microorganisms. The *Alumina* increased the survival rate of corn seedlings grown under acidic conditions (ANDRADE et al., 2006). According to Casali et al. (2009), the pathogenesis of *Alumina* 30D in soil was confirmed by the increase in metabolic quotient, by the accumulated soil microbial respiration rate and by the reduced soil electrical conductivity. The effect of the homeopathic

preparation *Alumina* on the microbiological status of the soil favors the hypothesis that microorganisms are stimulated by homeopathic preparations and this is related to the process of rebalancing the soil. Thus microbial activity could be related to the adjustment of the soil solution pH.

If the hypothesis of microbial activity is excluded, then the assumptions for *Alumina* 11CH activity are challenges for interpreting the physics and physico-chemical responses of acid soils. This interpretation goes beyond the medical understanding of Hahnemann and his followers concerning the effect of high dilutions on living systems.Further studies should be carried out aiming at mechanisms of *Alumina* activity in microorganisms and in the impact on soil acidity.

The soil is interpreted as a totality and understood as an alive system. Every living organism may have diseases or may loose health if treated badly, but also every living organism, carries within the power for recovering. The homeopathic preparations take action in living organism, such as soil, by increasing the reaction or by stimulating the inherent potential for recovering. The organism must be biologically brought into harmony carefully requiring therefore that, the causes of diseases must be known. Soil management should maintain the production of healthy foods that contribute to the health of consuming organisms, including humans. So, soil acidity play an important role in agriculture and human life. All management practices should improve organic and agroecological qualifications, also the physico-chemical and biological soil properties. For example, the incorporation of organic matter such as crop residues, and practices diversification that seek biodiversity. These are the ways to recover the biological balance of the ecosystem and contribute to maintain the soil healthy, what means a not acid

soil, or an acceptable acidity

According to Bignardi (1999), the soil dead by pesticides, generate intoxicated plants, and foods somehow poisoned. It is clear the importance of living soil for food production free of chemical residues. These foods can be used as nutraceuticals, and add values to agricultural products. Again, soil acidity is of great importance to life quality.

The health of humanity is closely linked to the health of agricultural soils. Research has shown that the human chronic intoxication and undernutrition of trace elements are a result of the agriculture in dead soil (BIGNARDI, 1999).

Bignardi (1999) also states that foods produced in alive soils reintegrate individuals to nature by establishing community activities that promote the recovery of collective consciousness for allowing the development of individuality.

The use of the homeopathic preparation *Alumina* to balance the pH of the soil solution contributes to the restoration of soil life avoiding the use of lime. In overdose or frequent applications liming can imbalance the soil-plant system, and the absorption of essential nutrients for plant growth. Moreover, the increasing demands for lime might disturb the place where it is extracted. Another argument favoring the use of *Alumina*, instead of using limestone, is the low cost. Homeopathic preparations are economically accessible to all farmers.

Conclusion

The reaction of acidified soil solution to potencies of *Alumina* was the increase in pH. Even the potency 11CH which is at the edge of Avogadro Law.

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CHAPTER 2

PATHOGENESIS OF *Natrum muriaticum* IN SOIL SOLUTION

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Keywords: Homeopathy. High Dilutions. Water Treatment.

Introduction

The water indicates the soil salinity conditions that are determinants of life and of soil evolutionary state. Through the water in the soil solution the physico-chemical properties of each soil are known.

The use of homeopathic preparations in agriculture was initiated by Rudolf Steiner in Germany. In 1999, Homeopathy was turned an official techinique in the brazilian organic agriculture, as a natural system that stimulate the defense of

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living organisms.

Pesticides reduce the plant vitality, damage water quality, disturbe soils and even the air. Farmers in many parts of Brazil are applying homeopathy to plants, with positive results in resistance, flowering, breaking the dormancy of seeds and production of healthy plants (CASALI et al., 2006). *Natrum muriaticum* has been recommended to soil of salinity tendency (CASALI, 2009) which is measured by electrical conductivity.

The trials of homeopathic preparations in healthy organisms (experimenter) are considered a fundamental procedure in Homeopathy. The signals generated in the experimenter are named primary action or homeopathic preparation pathogenesis. These signals appear in accordance to the experimenter sensitivity and they indicate the potential of substances for homeopathic treatment purposes (VITHOULKAS, 1980; LISBOA et al., 2005). The pathogenesis is the guide when homeopathic substance is chosen for each disturb, or each organism in accordance with the principle of similarity. The pathogenesis information are a part of the Homeopathic Acology.

The physico-chemical characteristic of water make known the conditions for life, and the soil solution display the possibilities to develop the agriculture.

The soil solution is the aqueous phase of the soil. Most of the chemical reactions of soil are in its solution. So, the reactions that control the retentions of solid phase, such as precipitation-dissolution, adsorption-desorption and ion exchange, they all are in the soil solution. These reactions determine the profile of the substances in the soil (ESSINGTON, 2004). The kinetic reaction and the biological

absorption rate control the ion concentration in soil water (CAMARGO et al., 2001). The absorption of nutrients and of water by plant roots involve the soil solution (RAIJ, 1991).

The chemical composition of soil solution provides the understanding of chemical and physical changes resulting from soil management. This chemical composition is the guide of agricultural soil practices (CAMPBELL et al., 1989).

Human activities have affected water quality especially, the discharge of effluents without any treatment that affect surface water. Inadequate handling of fertilizers and pesticides have damaged the quality of surface waters and consequently, the quality of the soil solution (MIRANDA et al., 2006).

The homeopathic preparations in contact with the water affect biological and physico-chemical properties of soils, such as activity and microbial efficiency, electrical conductivity, formation of aggregates and moisture retention capacity (ANDRADE, 2004).

The objective of this study was to evaluate the response of two samples of soil solution to potencies of *Natrum muriaticum.*

Materials and Methods

Two experiments were carried out at the Laboratory of Soil and Water Homeopathy, Department of Plant Science, Federal University of Viçosa (Brazil), in April 2011.

The experimental design was the completely randomized of seven treatments (2CH, 4CH, 6CH, 8CH,

10CH and 12CH of *Natrum muriaticum* and distilled water as control), four replicates and 28 experimental plots.

The experiments were differentiated regarding the origin and weight of the two clays used in the preparation of the soil solution. The weights were chosen in preliminary tests by the criterion of electrical conductivity stability of the solution throughout the day.

In twenty-eight borosilicate vials of 80 mL were placed 3 g of green clay and 60 ml of demineralized water. In another twenty-eight vials were placed 0.3 g of white clay and 60 ml of demineralized water. It was established as 24 hours for clay decantation. After this period it was withdrawn 40 ml of the overnatant solution: solution 1 (white clay) and solution 2 (green clay). In these soil solutions were applied five drops of the treatment, a single dose. *Natrum muriaticum* solutions were prepared in distilled water few minutes before the initiation of treatments. The mechanical arm machine performed the 100 succussions.

It was evaluated the electrical conductivity (CE) by the conductivimeter DM-32. The electrode was washed off by distilled water after each reading. The CE was measured in microsiemens per centimeter (µS/ cm), immediately after treatment (CE-T1), after 24 (CE-T2), after 48 (CE-T3) and after 72 hours (CE-T4) of the treatments. The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007). The treatment means were compared by Tukey test at 5% probability.

Results and Discussion

The soil solutions (white clay and green clay) were statistically responsive to homeopathic preparations (Table 1 and table 2).

Table 1 - Analysis of variance of electrical conductivity data immediately after treatment (CE T-1), after 24 hours (CE T-2), after 48 hours (CE T-3) and after 72 hours (CE T-4) of *Natrum muriaticum* application in the soil solution of white clay (solution 1). Viçosa / MG. 2011.

Source of variation	**DF**	**Mean Square**			
		CE T-1	**CE T-2**	**CE T-3**	**CE T-4**
Treatments	6	3.30^{ns}	2.86^{ns}	2.15	8.06*
Residue	21	2.09	1.63	0.82	2.44
CV (%)		2.21	1.98	1.38	2.39

^{ns}- not significant at 5% probability by F test
*-significant at 5% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

Table 2 - Analysis of variance of electrical conductivity data immediately after treatment (CET-1), after 24 hours (CE T-2), after 48 hours (.E T-3) and after 72 hours (CE T-4) of *Natrum muriaticum* application in soil solution of green clay (solution 2). Viçosa / MG. 2011.

Source of variation	DF	Mean Square			
		CE T-1	CE T-2	CE T-3	CE T-4
Treatments	6	237.24*	220.80ns	328.01*	414.77**
Residue	21	63.25	123.48	89.19	84.54
VC (%)		3.8	5.09	4.31	4.16

ns- not significant at 5% probability by F test
*-significant at 5% probability by F test
**-significant at 1% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

The soil solution of white clay (solution 1) was more stable. The white clay is of less dispersion, so validating the hypothesis of being less reactive. Only *Natrum muriaticum* 4CH was effective on reducing the CE, after 72 hours of treatment (Table 3).

The solution of green clay (solution 2) was more responsive to CE immediately after application of treatments. *Natrum muriaticum* 6CH reduced the CE of soil solution, and the response persisted after 72 hours of treatment application (Table 4).

The homeopathic preparation 10CH is considered as a molecular solution. So, it is feasible the molecular interference on CE. Even in small quantities, these molecules could have influenced the variables (LISBOA, 2010). However, the greater activity (table 3) of homeopathic

potencies (12CH) is considered a physico-chemical action beyond the Avogadro constant (LISBOA, 2010). In this experiment, reduction of CE is denying the possibility of molecules being added by treatments. In rural areas the 6CH is widely used and it is being recommended by Resende, (2010) as a new sustainable resource.

Responses were dependent on the potencies and the exposure time. The responses indicated the importance of investigating the pathogenesis of many potencies and the importance of the diversity of experimenters, as recommended in the Organon (LISBOA., 2005).

Assuming the soil solutions as healthy experimenters, the results imply on pathogenesis of *Natrum muriaticum.*

Table 3 - Mean values of electrical conductivity (µS / cm) immediately after treatment (CE T-1), after 24 hours (CE T-2), after 48 hours (CE T-3) and after 72 hours (CE T-4) of *Natrum muriaticum* application in a soil solution of white clay (solution 1). Viçosa / MG. 2011.

Treatments	**CE T-1**	**CE T-2**	**CE T-3**	**CE T-4**
Natrum muriaticum 2CH	67.02 A	63.12A	64.82A	62.20AB
Natrum muriaticum 4CH	64.07A	63.32A	64.25A	63.10B
Natrum muriaticum 6CH	65.20A	63.10A	65.40A	64.20AB
Natrum muriaticum 8CH	65.42A	65.32A	65.60A	64.90AB
Natrum muriaticum 10CH	64.82A	64.25A	65.82A	64.90AB
Natrum muriaticum 12CH	65.32A	64.25A	66.30A	66.52AB
Control- Distilled water	65.82A	64.22A	66.17A	67.15A

Means followed by the same letter, in column, do not differ at 5% probability by Tukey test.

Table 4 - Mean values of electrical conductivity (µS / cm) immediately after treatment (CE T-1), after 24 hours (CE T-2), after 48 hours (CE T-3) and after 72 hours (CE T-4) of *Natrum muriaticum* application in soil solution of Green Clay (solution 2). Viçosa / MG. 2011.

Treatments	**CE T-1**	**CE T-2**	**CE T-3**	**CE T-4**
Natrum muriaticum 2CH	212.8AB	219.97A	219.92AB	221.67AB
Natrum muriaticum 4CH	217.02A	226.10A	227.95AB	227.92A
Natrum muriaticum 6CH	196.05B	203.55A	205.17B	203.42B
Natrum muriaticum 8CH	203.3AB	214.52A	210.90AB	202.20AB
Natrum muriaticum 10CH	210.92AB	223.07A	226.10AB	227.30A
Natrum muriaticum 12CH	202.52AB	217.92A	215.00AB	219.00AB
Control- Distilled water	214.95AB	221.37A	228.37A	233.02A

Means followed by the same letter, in column, do not differ at 5% probability by Tukey test.

Conclusion

The pathogenesis of *Natrum muriaticum* was the reduction of the electrical conductivity in soil solutions. The activity of the homeopathic preparation in soil solution depend on the clay and the potency.

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CHAPTER 3

TURBIDITY OF WATER TREATED WITH HOMEOPATHIC PREPARATIONS

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Introduction

Water, a chemical substance composed of hydrogen and oxygen, is essential to all known forms of life. The structure is simple but the scientific knowledge is still limited. The characteristics of water are very specific. The physico-chemical activity of water is quite distinct from other substances with similar chemical structure. It is considered

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the universal solvent and is 80% of Earth surface and 70% of the mass of human body (FIGUEIREDO, 2009).

The increasing in population implies on the consequent increase in consumption of drinking water (200L/hab./dia) and in greater use of water in agriculture (irrigation) and livestock. Water is well accepted as priority to health and welfare. The current model of technological development has caused pollution, and contamination of natural resources, of water resources and of water for human body. There is a necessity of treatment systems with standard potability to attend the requirements of water quantity and quality (CORREIA et al., 2008).

The turbidity of the water is the change in light penetration caused by suspended solids (clay, silt, colloids, silica), organic matter, microorganisms, algae, calcium carbonate, among others (PINTO, 2004). Turbidity is measured by comparing the scattering of the beam to pass through the sample with the scattering of the beam of equal intensity passing through the standard suspension. The higher the spreading the greater the turbidity. Values are expressed in Nephelometric Turbidity Unit (NTU). The color of water adversely affects the measurement of the turbidity due to water property of absorbing light (CORREIA et al., 2008). The turbidity of the water is altered by pollution.

Turbidity is a measure of water quality for public supply. The potability standard 5.0 NTU was determined by the WHO- World Health Organization (PINTO, 2004). There is a specific importance in controlling water quality, because of the association with some pathogens. As a result of increased turbidity, there is a reduction of light penetration in water and less photosynthesis of algae and aquatic plants. The

increase in surface water temperature is due to heat absorption by the particles in suspension near the surface. Turbidity has not been measured in experiments of high dilutions (Homeopathy) but aiming at sustainable water treatment by the family farm, this physico-chemical variable should be considered (FIGUEIREDO, 2009).

Water turbidity is related to dissolved solids and to suspended solids from runoff and earthworks. The conventional water treatment is not completely effective. Studies have been performed and homeopathic treatments are available, as example, for the reduction of water turbidity. Figueiredo (2009) and Gomes (2009) found homeopathic preparations that changed the water turbidity.

According to the experimental protocol, the homeopathic solutions should be submitted to trials and there must be diversity of experimenters. Pathogenesis are the signals from healthy organism after application of homeopathic preparations. These signs are the markers of the similarity for treatment purposes, also they are part of Homeopathic Acognosy.

This study was aimed at pathogenesis of homeopathic solutions in turbidity of three water samples: spring water, pond water and mineral water.

Materials and Methods

Three experiments were carried out at the Laboratory of Homeopathy for Soil and Water, Department of Plant Science, Federal University of Viçosa, UFV, MG Brazil. There were two healthy waters from a natural source: mine water (spring water) from the campus of UFV, and mine water (bottled and

traded) labeled mineral water, purchased at a local market. The third one was the polluted water sampled off a pond located at UFV campus.

The first experiment, in a randomized block design was carried out in September 2010. The mine water (spring water) was collected directly from a waterhead at Federal University of Viçosa (UFV), which has been taken for direct consumption along with decades.

The second experiment, in a completely randomized design, was carried out in July 2011, with bottled water purchased in a local market, named mineral water, and characterized by: pH 5.6; water temperature 19.0 ° C at source, electrical conductivity 27 μS / cm and evaporation residue at 180 ° C, 25.22 mg / L.

The third experiment, in a randomized block design, was carried out in September 2010 with pond water. The sample was collected in a pond located at UFV campus where discarded water and waste are poured.

There were five replicates, 65 experimental plots and thirteen treatments: Dynamized Water 7CH, *Natrum muriaticum* 7CH, *Alumina* 7CH, *Silicea* 7CH, *Carbo vegetabilis* 7CH, *Arnica montana* 7CH, *Nux vomica* 7CH, *Pyrogenium* 7CH, *Calcarea carbonica* 7CH, *Sulphur* 7CH, *Lycopodium clavatum* 7CH, Ethanol 20% and Control. In sixty-five borosilicate vials of 100 mL with 80 mL of each water, were applied two drops of the treatment, except in the case of control, in a single dose under the double blind procedure. The homeopathic preparations purchased were already prepared with ethanol 20%.

Dynamized Water 7CH treatment was the homeopathic

solutions of the three waters (mine, mineral and pond), that were prepared and named Mine Water 7CH, Mineral Water 7CH and Pont Water 7CH (DORES et al., 2007). The mechanical arm machine performed the 100 succussions.

It was evaluated the turbidity (TURB) by the digital portable turbidimeter DM TU, range 0-1000 NTU. The turbidity was measured after 24 hours (TURB 1), after 48 hours (TURB 2) and after 72 hours (TURB 3) of treatments. The electrode was washed off by distilled water before the following reading.

The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007), and the mean values were compared by Tukey test at 5% probability.

Results and Discussion

The homeopathic treatment affected statiscally the turbidity of mine water (Table 1). Homeopathic preparations increased turbidity after 24 hours of application in water. Mine Water 7CH and *Alumina* 7CH differed statistically from the controls (Table 2). The increased turbidity caused by Mine Water 7CH is consistent with the result from Lisboa research (2010). Mine Water 7CH, made of water, was interpreted as isopathy (autonosode or isoterapic) (LISBOA, 2010).

The results of experiments 1 and 2 were considered as provings. By the principle of similarity and experimentation the high dilution (homeopathic preparation) that increased the turbidity may decrease water turbidity (GOMES, 2009). Thus, homeopathic preparations are potential reducers of turbidity in turbid waters.

After 48 hours of treatment application still there was

statistically significant effect of *Alumina* and *Sulphur* perhaps because both are of slower homeopathic activity (CASALI et al., 2006). There was no more activity of homeopathic solutions in water turbidity after 72 hours (table 1, table 2) of treatments.

Table 1 - Analysis of variance of turbidity data, after 24 hours (TURB 1), after 48 hours (TURB 2) and after 72 hours (TURB 3) of treatment application in mine water. Viçosa / MG. 2010.

Source of variation	**DF**	**Mean Square**		
		TURB-1	**TURB-2**	**TURB-3**
Treatment	12	3.602**	0.96*	2.894^{ns}
Block	4	0.9675	0.4636	2.362
Residue	48	0.989	0.4636	2.477
VC (%)		50.54	47.26	110.98

**significant at 1% by F test
*significant at 5% by F test
^{ns} not significant
DF- Degrees of freedom
VC- Variation coefficient

Table 2 - Mean values of turbidity (NTU) after 24 hours (TURB-1), after 48 hours (TURB-2) and after 72 hours (TURB-3) of treatments application in mine water. Viçosa / MG. 2010.

Treatments	**TURB-1**	**TURB-2**	**TURB-3**
Mine Water 7CH	2.66A	1.68AB	1.86A
Natrum muriaticum 7CH	1.99ABC	1.45AB	1.30A
Alumina 7CH	3.53A	1.93A	1.50A
Silicea 7CH	2.27ABC	1.75A	1.49A
Carbo vegetabilis 7CH	1.00BC	1.12AB	3.58A
Arnica montana 7CH	2.23ABC	1.12AB	0.90A
Nux vomica 7CH	2.34ABC	1.60AB	1.30A
Pyrogenium 7CH	1.70ABC	1.14AB	1.25A
Calcarea carbonica 7CH	2.38ABC	1.21AB	1.52A
Sulphur 7CH	2.14ABC	1.80A	1.05A
Lycopodium 7CH	2.22ABC	1.67AB	0.98A
Control- Ethanol 20%	0.95BC	1.37AB	1.59A
Control, no application	0.20C	0.25B	0.24A

Means followed by at least one same letter, in column, do not differ by Tukey test at 5% probability.

There was significant difference in turbidity of mineral water after 48 hours and 72 hours (Table 3) of treatment.

Table 3 - Analysis of variance of turbidity data after 24 hours (TURB-1), after 48 hours (TURB-2) and after 72 hours (TURB-3) of treatment application in mineral water. Viçosa / MG. 2011.

Source of variation	DF	Mean Square		
		TURB-1	TURB-2	TURB-3
Treatments	12	0.46^{ns}	1.69**	3.22**
Residue	52	0.30	0.33	0.52
VC (%)		114.7	51.90	53.69

**significant at 1% probability by F test

^{ns}- not significant

DF- Degrees of freedom

VC- Variation coefficient

After 48 hours and 72 hours *Alumina* increased the turbidity. Homeopathic preparations significantly increased the turbidity of mineral water in a consistent way somehow like the data of Figueiredo (2009).

The mine water is considered a healthy experimenter, so it was used in this test of pathogenesis in agreement with reports of Figueiredo (2009). But, due to some factors, such as rock type, soil type and climatic conditions, waters differ in physico-chemical and biological properties. So, the two waters (mineral and mine) were supposed as healthy and diverse experimenters.

The times for response to homeopathic preparations were different between waters (mine and mineral). In experiment 1, the change in turbidity of mine water mine was detected after 24 hours of treatment (Table 2). In experiment

2, the response of mineral water arised after 48 hours of treatment (Table 4). The activity of homeopathic solutions was dependent on the experimenter. It was noted that *Alumina* and *Sulphur* increased the turbidity. Of both healthy waters the results confirm the importance of experimenters diversity in pathogenesis tests.

Table 4 - Mean values of turbidity after 24 hours (TURB-1), after 48 hours (TURB-2) and after 72 hours (TURB-3), of treatment applications in mineral water. Viçosa / MG. 2011.

Treatments	**TURB-1**	**TURB-2**	**TURB-3**
Mineral Water 7CH	0.44A	0.91BCD	1.50ABCD
Arnica montana 7CH	0.20A	0.32D	0.28D
Lycopodium clavatum 7CH	0.95A	1.69ABC	1.89ABC
Sulphur 7CH	0.92A	1.90AB	2.80AB
Alumina 7CH	0.98A	2.40A	2.99A
Silicea 7CH	0.48A	0.98BCD	1.46ABCD
Calcarea carbonica 7CH	0.20A	0.57CD	0.59CD
Nux vomica 7CH	0.35A	0.91BCD	0.68CD
Natrum muriaticum 7CH	0.49A	0.88BCD	1.03CD
Carbo vegetabilis 7CH	0.24A	0.88BCD	1.07CD
Pyrogenium 7CH	0.19A	0.77BCD	0.91CD
Control, no aplication	0.47A	0.82BCD	1.07CD
Control - Ethanol 20%	0.46A	1.43ABCD	1.22BCD

Means followed by at least one same letter, in column, do not differ by Tukey test at 5% probability.

By the F test the effect of treatment was significant after

24 hours and after 72 hours (Table 5) of treatments. The mean values were statistically different after 72 hours of application (Table 6). The pond water, carrying on several residues, is chemically more complex, so, that is the reason for the variability among replicates and the lack of significance after 24 hours or 48 hours (table 6) of application.

Arnica montana, *Sulphur* and *Calcarea carbonica* increased water turbidity (after 72 hours). The solvent of homeopathic preparations (Ethanol 20%) increased the turbidity, compared to the control no-application, what was expected.

The pond water is considered disturbed. Therefore, the results are interpreted as a reaction for bringing back the system to harmony. The purpose of these studies on reactions of disturbed water is to develop future technologies of water treatment based on Homeopathy principles and procedures.

Table 5 - Analysis of variance of turbidity data after 24 hours (TURB-1), after 48 hours (TURB-2) and after 72 hours (TURB-3) of treatments in the pond water. Viçosa / MG. 2010.

Source of variation	**DF**	**Mean Square**		
		TURB-1	**TURB-2**	**TURB-3**
Treatments	12	0.3162**	12.965ns	2.6199**
Rep.	4	0.1075	1.2088	0.5195
Residue	48	0.1159	7.7003	0.6394
VC (%)		30.34	91.80	31.76

**significant at 1% probability by F test

ns not significant

DF- Degrees of freedom

VC- Variation coefficient

Table 6 - Mean values of turbidity (NTU) after 24 hours (TURB-1), after 48 hours (TURB-2) and after 72 hours (TURB-3) of treatments application in the pond water. Viçosa / MG. 2010.

Treatments	**TURB-1**	**TURB-2**	**TURB-3**
Pond Water 7CH	0.96A	1.98A	2.21AB
Natrum muriaticum 7CH	1.31A	2.43A	2.58AB
Alumina 7CH	1.00A	2.27A	2.27AB
Silicea 7CH	0.87A	2.33A	2.10AB
Carbo vegetabilis 7CH	1.15A	2.28A	2.44AB
Arnica montana 7CH	0.97A	3.74A	3.67A
Nux vomica 7CH	1.06A	2.06A	2.60AB
Pyrogenium 7CH	1.14A	3.80A	2.52AB
Calcarea carbonica 7CH	1.30A	2.50A	2.92A
Sulphur 7CH	1.62A	3.16A	3.54A
Lycopodium 7CH	1.48A	2.71A	2.62AB
Control, Ethanol 20%	1.02A	2.27A	2.58AB
Control, no application	0.70A	0.73A	0.68B

Means followed by same letter, in column, do not differ significantly by Tukey test at 5% probability.

The response of living organisms to homeopathic preparations depends on the level of intoxication (LISBOA et al., 2005). The mine water and mineral water are considered healthy systems and responded quickly to homeopathic treatment, but the diseased or intoxicated pond water, responded after 72 hours of treatment.

According to Lisboa (2010), the increase in turbidity, as a result of high dilutions (homeopathic preparations) treatment was caused by changes in water structure. A change in visual appearance of the pond water was observed in the experiment. In all experimental plots, except the first control (Ethanol 20%) and the second control (no applications) there were a gelatinous aspect in the water. That was interpreted as a response of the Pond Water. In the experiment of mine water a gelatinous structure of filamentous was present.

The results also show the activity of homeopathic preparations on the vitality of the water by means of microorganisms. According to Andrade (2004), the homeopathic preparations increase microbial activity in the soil solution, because there is increase in microbial respiration.

Conclusion

Homeopathic preparations activity of potency 7CH changed water turbidity. The most effectives were: *Sulphur*, *Silicea*, *Arnica montana*, *Alumina*, *Calcarea carbonica*, Mine Water 7CH, Mineral Water 7CH and Pond Water 7CH. The increased turbidity of water (mineral and mine) was interpreted as pathogenesis. The results of the pond water were interpreted as reactions.

The specific activity of homeopathic preparations and the time to pathogenesis appearance depend on the experimenter.

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CHAPTER 4

Natrum muriaticum AND ELECTRICAL CONDUCTIVITY OF SOIL SOLUTIONS SUBJECTED TO LIGHT

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Introduction

The water is analyzed chemically, physico-chemically and biologically like the soil solution which is the aqueous phase of the soil. Solutes of soil solution can influence growth and development of living organisms. According to Brady (1983), the soil solution is fast shifting also volume instable, and the proportion of soluble components is quite variable.

Studies on electrical conductivity (CE) of soils have

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shown the possibilities for clay content quantification (WILLIAMS & HOEY, 1987). The knowledge on soil electrical conductivity enables some inferences about nutrients availability, toxic ions and also osmotic potential of soil solution.

According to Johnson et al. (2001), there is a significant correlation between quality and quantity of clay content and salts (soluble cations and anions) in soil solutions.

The clays may be well differentiated by color which is related to mineral composition that affects the electrical conductivity of the soil solution and the spectral soil profile. Spectral reflectance is influenced by: clay color, clay concentration and particle size as components of the soil (DALMOLIM et al., 2005).

In agriculture, the highly diluted solutions (homeopathic preparations) are applied to disease control to be of benefit to yield and plant defense. Also are being applied to the soil. *Arnica montana, Sulphur, Nux vomica, Natrum muriaticum, Phosphorus, Thuja occidentalis, Carbo vegetabilis, Calcarea carbonica, Medorrhinum, Staphysagria, Mercurius solubilis, Kalium iodatum* has shown excellent results (CAPA, 2004).

Homeopathic treatments are based on four principles: similarity, experiments in healthy organism, minimum doses and single substance (VITHOULKAS, 1997). The homeopathic preparations are studied scientifically in many healthy experimenters and pathogenesis is the name of these studies (LISBOA et al., 2005).

Based on the hypothesis that solutions of diversed clay soils could be experimenters of homeopathic preparations, this research was developed. The study of the pathogenesis of

homeopathic preparations in soil solutions supply informations that potentially may contribute to soils management and irrigation. These informations are incluted in the Homeopathic Acognosy.

Natrum muriaticum is obtained from sodium chloride. It is recommended for saline balance of organisms (CASALI et al., 2009). *Natrum muriaticum* changes the electrical conductivity, as evidenced in soils by Andrade (2004) and in water by Lisboa (2010).

This study aimed at pathogenesis of *Natrum muriaticum,* in electrical conductivity of soil solutions, influenced or not by light.

Materials and Methods

Two experiments were carried out at the Laboratory of Homeopathy for Soil and Water, Department of Plant Science, Federal University of Viçosa, Brazil, in April 2011.

In each trial the experimental design was the completely randomized with five replicates, 20 experimental plots and four treatments: 1 - *Natrum muriaticum* 6CH, under light, 2 - distilled water, under light, 3 - *Natrum muriaticum* 6CH, in the dark 4 - distilled water, in the dark.

The experiments were differentiated regarding the origin and weight of clays used for preparation of soil solution. The weights of the clays were chosen in preliminary tests and the criterion was the stability of electrical conductivity along with time.

Inside twenty borosilicate vials of 80 mL were placed 3 g of green clay and 60 ml of demineralized water. In another

twenty vials were placed 0.3 g of white clay and 60 ml of demineralized water. The sedimentation time of clays was 24 hours. After sedimentation it was taken 40 ml from the overnatant solutions, then named "soil solution 1" (white clay) and "soil solution 2" (green clay). The vials of dark treatment were covered with aluminum foil. *Natrum muriaticum* 6CH was applied, a single dose of five drops. *Natrum muriaticum* 6CH was prepared in distilled water ten minutes before application. The mechanical arm machine performed the 100 succussions.

The electrical conductivity (CE) was measured (microsiemens per centimeter) by the conductivimeter DM-32. The electrode was washed off with distilled water before the following reading. The CE was measured immediately after treatment (CE-T1), after 24 hours (CE-T2), after 48 hours (T3-CE) and after 72 hours (CE-T4) of treatment. The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007). The means were compared by Tukey test at 5% probability.

Results and Discussion

The soil solutions were statistically responsive to light and to *Natrum muriaticum* (Tables 1 and 2). *Natrum muriaticum*, obtained from the sodium chloride, affected the saline balance of soil solution as reported by Casali et al. (2009), both in light and in dark.

In the soil solution 1 (white clay), the *Natrum muriaticum* 6CH reduced the CE immediately after application and the effect was persistent between 24 and 72 hours after treatment. There was no significant effect of light (Table 3). In the soil solution 2 (green clay), with *Natrum*

muriaticum 6CH, under light, the CE was significantly different from control (distilled water). Under dark, the responses of green clay, to *Natrum muriaticum* were less evident (Table 4).

Table 1 - Analysis of variance of electrical conductivity data from soil solution 1 (white clay), immediately after treatment (C.E1), after 24 hours (C.E2), after 48 hours (C.E3) and after 72 hours (C.E4) of treatments. Viçosa / MG. 2011.

Source of Variation	DF	Mean Square			
		C.E1	C.E2	C.E3	C.E4
Treatments	3	1.81*	1.14**	2.75**	4.14**
Error	16	0.47	0.67	0.15	0.29
VC (%)		1.05	0.39	0.59	0.82

**-significant at 1% probability by F test
*-significant at 5% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

Table 2 - Analysis of variance of electrical conductivity data from soil solution 2 (green clay) immediately after treatment (C.E1), after 24 hours (C.E2), after 48 hours (CE 3) and after 72 hours (C.E4) of treatments. Viçosa / MG. 2011.

Source of Variation	**DF**	**Mean Square**			
		C.E1	**C.E2**	**C.E3**	**C.E4**
Treatments	3	2540.43*	2740.66**	2874.84**	3342.27**
Residue	16	261.09	267.85	245.00	233.94
VC (%)		7.15	6.98	6.77	6.51

**-significant at 1% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

Table 3 - Mean values of electrical conductivity (µS / cm) of soil solution 1 (white clay) after treatment (C.E1), after 24 hours (C.E2), after 48 hours (C.E3) and after 72 hours (EC 4) of treatments. Viçosa / MG. 2011.

Treatments	**C.E1**	**C.E2**	**C.E3**	**C.E4**
Dark: Clay + Distilled water	66.28A	65.78A	68.14A	66.78A
Dark: Clay + *Natrum muriaticum* 6CH	65.08AB	65.12B	66.94B	65.34B
Light: Clay + Distilled water	65.14AB	65.76A	67.68A	66.70A
Light: Clay + *Natrum muriaticum* 6CH	65.02B	64.82B	66.48B	65.02B

Means followed by the same letter, in column, do not differ at 5% probability by Tukey test

Table 4 - Mean values of electrical conductivity (µS / cm) of soil solution 2 (green clay) after treatment (C.E1), after 24 hours (C.E2), after 48 hours (C.E3) and after 72 hours (C.E4) of treatment. Viçosa / MG. 2011.

Treatments	**C.E1**	**C.E2**	**C.E3**	**C.E4**
Dark: Clay + Distilled water	247.0A	254.6A	254.7A	258.2A
Dark: Clay + *Natrum muriaticum* 6CH	223.9AB	233.7A	227.6AB	232.4A
Light: Clay + Distilled water	237.2A	247.0A	243.1A	248.8A
Light: Clay + *Natrum muriaticum* 6CH	195.1B	201.6B	199.3B	199.3B

Means followed by the same letter, in column, do not differ at 5% probability by Tukey test.

According to Bonato (2004), the homeopathic preparations behave like energy and also in agreement to physics laws of electromagnetic waves. As the light is electromagnetic energy, differently to homeopathic preparation, it was expected that lighting conditions would affect the responses to treatments.

The responses of the prepared solutions of white clay and green clay were changeable with light. The effect of light was not enough to affect the CE, however, the homeopathic preparation changed the CE of the green clay solution under light conditions.

It can be deduced that there is a correlation of electromagnetic waves of *Natrum muriaticum* 6CH with electromagnetic waves of the clays as the same way that there

is a correlation of the green pigment in plant leaves, with light absorption.

Conclusion

The soil solutions are responsive to *Natrum muriaticum* 6CH. Light and dark conditions affected the activity of homeopathic preparation.

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CHAPTER 5

PATHOGENESIS OF HOMEOPATHIC PREPARATIONS IN SOIL SOLUTION

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Keywords: High Dilutions. Water Treatment. Water Electrical Conductivity,

Introduction

The water is supposed to be a convenient and fundamental experimenter of homeopathic preparations, however, the healthy water. Water is a major constituent of the vital processes, so, water responses to homeopathic preparations probably enables some generalizations of research data on Homeopathic Acognosy or Acology. Soil solution is defined as the aqueous phase of the soil, so it is

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also fundamental to soil basic research concerning homeopathic preparations.

According to the Principle of Homeopathy named experimentation, the signals caused by homeopathic solutions to the experimenter are the pathogenesis. So, they are signs, not symptoms. The signals arise in accordance with the responsiveness of the experimenter and they are the markers of the homeopathic solution and are basic to therapeutic procedures in general (VITHOULKAS, 1980). The pathogenesis manages the choice of the homeopathic preparations according to the principle of similarity.

Most of the chemical reactions that succeed in the soil are mediated or they occur in the soil solution. In soil solution there is retention of substances, such as precipitation-dissolution, adsorption-desorption and ion exchange. These reactions determine the activity of many substances in the soil (ESSINGTON, 2004). Ion concentrations of soil solution are controlled by the kinetics of the reactions and by the absorption rate. The absorption of chemical nutrients and water by plant roots involves the soil solution (RAIJ, 1997). The chemical composition of the soil solution enables understanding the physico-chemical changes resulted from agricultural activities (CAMPBELL et al., 1986).

The characteristics of the soil solution partly depend on natural conditions, and the original clay characterizes deeply the soil. Furthermore, they depend on the legacy of industrializations processes, of conventional agriculture and of consumerism that disrupt the natural balance of most ecosystems. The loss of water quality is a result of inadequate management of natural resources (QUIAN et al., 1994).

Human activities that discharge effluents without any

prior treatment have affected the quality and quantity of water, especially the surface water. (MIRANDA et al., 2006). The pH of the soil solutions after those human activities interfere with the availability of nutrients which are essential to plant development (BRANDÃO & LIMA, 2002).

The homeopathic preparations may modify the physico-chemical characteristics of the water (FIGUEIREDO, 2009), and are promising resources for the management of the soil solution.

This study aimed at the electrical conductivity of soil solutions subjected to application of nine homeopathic preparations.

Materials and Methods

Three experiments were carried out at the Laboratory of Homeopathy for Soil and Water, Department of Plant Science, Federal University of Viçosa, Brazil, in July 2011. The experiments differed on the clays used in the preparation of the soil solution. There were three clays: green, white and yellow.

The trial design was the completely randomized of four replicates, 44 experimental plots, eleven treatments: control (no application), *Lycopodium*, *Nux vomica*, *Carbo vegetabilis*, *Alumina*, *Pyrogenium*, *Natrum muriaticum*, *Calcarea carbonica* , *Arnica montana*, *Sulphur*, Distilled Water, all in potency 7CH.

Homeopathic solutions were prepared in distilled water few minutes before the application of treatment, following the standard procedures (DORES et al., 2007). The mechanical arm machine performed the 100 succussions.

In preparing soil solutions, inside three vials, each containing 2900 ml of demineralized water, it was added 145g of the green clay, 14.5 g of white clay and 14.5 g of yellow clay respectively. After 24 hours of decantation, it was sampled 60 mL from the overnatant solution and poured into the 80mL borosilicate vials. In each experimental plot (vial) it was applied five drops per treatment, except the control.

After 24 hours, 48 hours and 72 hours of applications it was measured: electrical conductivity (CE) by the conductivimeter DM-32 and pH by the potentiometer DM-23. The electrode was washed off by distilled water before the following reading. The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007), and the means were compared by Tukey test at 5% probability.

Results and Discussion

The homeopathic preparations changed the pH and CE of green clay solutions along with the experimental period (Table 1).

After 24 hours of treatment, the homeopathic preparations increased the pH of the solution. The increased pH in the soil solution by *Lycopodium* was significantly greater than the pH of the remaining treatments throughout the experimental period. After 48 and 72 hours, there was also increase in pH by *Nux vomica* (Table 2). The CE was increased only after *Lycopodium* treatment, and the effect was persistent even after 72 hours (Table 2) of application.

Table 1 - Analysis of variance of pH and Electrical Conductivity (CE) data, after 24 hours (pH1, CE1), after 48 hours (pH 2, CE2) and after 72 hours (pH 3, CE3) of treatment application in solution of green clay. Viçosa / MG. 2011.

Source of Variation	DF	Mean Square					
		pH1	CE1	pH2	CE2	pH3	CE3
Treat.	10	1.14**	1029.93**	0.55**	657.25**	0.61**	2613.81**
Res.	3	0.32	70.88	0.10	66.49	0.12	471.14
VC (%)		2.24	3.98	1.26	3.82	1.41	9.95

** significant at 1% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

Table 2 - Mean values of pH and Electrical Conductivity, after 24 hours (pH1, CE1), after 48 hours (pH 2, CE2) and after 72 hours (pH 3, CE3) of treatments in the soil solution of green clay. Viçosa / MG. 2011.

Treatments	**pH1**	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Lycopodium 7CH	9.0A	259.1A	8.9A	250.0A	8.9A	293.7A
Nux vomica 7*CH*	8.1B	208.5B	8.5B	216.2B	8.7A	217.5B
Carbo vegetabilis 7*CH*	9.0A	215.4B	8.0CD	218.7B	8.2B	222.6B
Alumina 7CH	8.2B	205.6B	7.8DE	208.4B	8.1BC	213.0B
Pyrogenium 7*CH*	7.8BC	206.2B	7.8DE	207.5B	7.9CD	208.3B
Natrum muriaticum 7CH	7.6C	205.4B	7.8DE	207.7B	7.8CD	208.6B
Calcarea carbonica 7*CH*	7.6C	206.7B	7.8BE	206.3B	7.8D	208.9B
Arnica 7CH	7.6C	204.9B	7.7E	207.6B	7.8D	207.6B
Sulphur 7CH	7.5C	204.5B	7.7E	208.1B	7.8CD	206.8B
Distilled Water 7CH	7.9BC	204.3B	7.9CDE	206.7B	7.9CD	204.7B
Distilled water (Control)	8.2B	207.6B	8.1C	209.6B	8.0BC	209.6B

Means followed by at least one same letter, in column, do not differ at 5% probability by Tukey test.

In the soil solution of white clay the homeopathic preparations changed the pH along with the experimental period. However, the CE was changed after 72 hours of treatment application (Table 3).

Lycopodium increased the pH of the solution along with experimental period. After 24 hours *Nux vomica* increased the

pH. But after 48 hours all homeopathic preparations increased the pH, especially *Lycopodium*, *Nux vomica*, *Carbo vegetabilis*, *Alumina* and *Pyrogenium*. After 72 hours of applications *Lycopodium*, *Nux vomica* and *Carbo vegetabilis* statistically increased the pH (Table 4).

The CE of white clay solution was increased by *Lycopodium* after 72 hours of applications (Table 4).

Table 3 - Analysis of variance of pH and Electrical Conductivity (CE) data, after 24 hours (pH1, CE1), after 48 hours (pH 2, CE2) and after 72 hours (pH 3, CE3) of treatment application in the soil solution of white clay. Viçosa/ MG. 2011.

Source of Variation	**DF**	**Mean Square**					
		pH1	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Treat.	10	0.22**	2.69^{NS}	1.48**	2.18^{NS}	0.90**	411.08**
Res.	33	0.12	2.24	0.17	2.87	0.25	80.11
VC (%)		1.50	2.42	1.71	2.73	2.00	13.73

**significant at 1% probability by F test

^{ns}not significant.

DF- Degrees of freedom

VC- Variation coefficient

Table 4 - Mean values of pH and Electrical Conductivity after 24 hours (pH1, CE1), after 48 hours (pH 2, CE2) and after 72 hours (pH 3, CE3) of treatments application in solutions of white clay. Viçosa / MG. 2011.

Treatments	**pH1**	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Lycopodium 7CH	8.0A	62.9A	9.2A	63.7A	8.9A	95.7A
Nux vomica 7CH	7.7B	61.5A	8.2B	62.1A	8.7A	63.1B
Carbo vegetabilis 7CH	7.5BC	61.7A	7.8C	62.1A	8.2B	62.1B
Alumina 7CH	7.3BC	61.5A	7.7CD	61.3A	7.9BC	62.0B
Pyrogenium 7CH	7.3CD	61.1A	7.5DE	62.2A	7.9BC	62.0B
Natrum muriaticum 7CH	7.3CD	61.1A	7.4DEF	62.1A	7.8C	62.1B
Calcarea carbonica 7CH	7.2CD	61.9A	7.3EF	61.3A	7.7C	61.6B
Arnica 7CH	7.2CD	61.5A	7.4DEF	61.8A	7.6C	62.7B
Sulphur 7CH	7.2D	63.2A	7.2EF	61.8A	7.6C	61.8B
Distilled Water 7CH	7.3CD	61.9A	7.2EF	63.3A	7.6C	61.7B
Distilled Water (Control)	7.22CD	63.3A	7.1F	62.4A	7.6C	62.2B

Means followed by at least one same letter, in column, do not differ at 5% probability by Tukey test.

The treatments caused a significant effect on pH after 48 hours of application in yellow clay solution. The effects on the CE were significant after 24 hours of applications and along with the experimental period (Table 5).

After 72 hours of application, all homeopathic preparations increased the pH of the yellow clay solution (Table 6). A significant increase in CE was caused by *Lycopodium* throughout the experimental period.

Table 5 - Analysis of variance of pH and Electrical Conductivity (CE) data, after 24 hours (pH1, CE1), after 48 hours (pH 2, CE2) and after 72 hours (pH 3, CE3) of treatment application in yellow clay solution. Viçosa / MG. 2011.

Source of Variation	**DF**	**Mean Square**					
		pH1	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Treat.	10	0.52^{ns}	208.90**	0.15**	206.88^{ns}	1.46**	165.10**
Res.	33	0.38	49.81	0.51	59.65	0.12	54.25
VC (%)		2.85	13.48	3.22	14.72	1.39	14.47

** significant at 1% probability by F test

^{ns}not significant

DF- Degrees of freedom

VC- Variation coefficient

Table 6 - Mean values of pH and Electrical Conductivity (CE) data after 24 hours (pH1, CE1), after 48 hours (pH 2, CE2) and after 72 hours (pH 3, CE3) of treatments application in solution of yellow clay. Viçosa/MG.2011.

Treatments	**pH1**	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Lycopodium 7CH	7.1A	74.1A	7.4A	47.1A	9.22A	68.6A
Nux vomica 7*CH*	7.0A	51.4B	7.3A	50.9B	8.95B	51.0AB
Carbo vegetabilis 7*CH*	6.9A	50.6B	7.1A	50.2B	8.45B	50.2B
Alumina 7CH	6.9A	51.3B	7.0A	51.0B	8.10D	51.1AB
Pyrogenium 7*CH*	6.8A	50.2B	7.0A	50.2B	8.00DE	49.8B
Natrum muriaticum 7CH	6.8A	50.3B	6.9A	50.3B	7.8DE	50.1B
Calcarea carbonica 7*CH*	6.8A	49.5B	6.9A	50.2B	7.7FA	49.5B
Arnica 7CH	6.8A	49.7B	6.8A	49.9B	7.7FG	49.3B
Sulphur 7CH	6.8A	49.9B	6.95A	49.7B	7.55G	48.8B
Distilled Water 7CH	6.8A	49.4B	6.9A	49.7B	7.50G	41.6B
Distilled water (Control)	6.9A	49.7B	6.8A	51.0B	7.42G	50.0B

Means followed by at least one same letter, in column, do not differ at 5% probability by Tukey test.

Pathogenesis were differentiated according to the exposure time to homeopathic preparation. The results of *Lycopodium* 7CH are of coherence with the pathogenesis of Distilled Water. It was reported that *Lycopodium* caused pathogenesis in some water physico-chemical properties:

increased CE, pH and turbidity, but reduced temperature (CASALI et al., 2009). As reported by Andrade et al. (2010), among the rural experiences of homeopaths, *Lycopodium* increases the moisture of soils.

In accordance with reports of Casali et al. (2009), *Lycopodium* in human bodies rescues some lost potential attributes. *Lycopodium* is one of the oldest vegetal species still present on Earth and may help the plants to retain moisture (CAMPOS, 2004).

Conclusion

There was pathogenesis of homeopathic preparations in the solutions of clay. The pH and electrical conductivity of clay solutions were affected by homeopathic preparations.

The responses were dependent on the clay and on the time of exposure to treatment.

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CHAPTER 6

PATHOGENESIS OF HOMEOPATHIC PREPARATIONS IN MINERAL WATER

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Keywords: High Dilutions. Water Treatment. Homeopathy.

Introduction

The mine water is considered a living system under equilibrium and therefore is useful in basic experiments of homeopathic preparations (FIGUEIREDO, 2009) termed homeopathic acognosy.

The indicators of water quality, as electrical conductivity, pH, dissolved oxygen and turbidity are some markers of pathogenesis caused by homeopathic preparations

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in water (FIGUEIREDO, 2009; GOMES, 2009, LISBOA, 2010).

According to the Principle of Experimentation in Homeopathy, high dilutions must be experienced under many potencies and in diversed healthy experimenters, in order to find the most complete picture of pathogenesis (LISBOA et al., 2005). The study of pathogenesis is constructive, so, as new experimental results are released, they are added to published provings in the Homeopathic Acognosy or Acology.

The homeopathic preparations for treatment purposes are chosen based on pathogenesis studies. The homeopathic solutions access the self regulation since they have similarities with the living system and so they promote equilibrium (CASALI et al., 2006).

The health of people is closely linked to safety foods. Food quality depends on healthy factors of agricultural systems, and water is the major quality factor (ANDRADE et al., 2011). In rural areas, water is often polluted due to general mishandling of residues, the use of agrochemicals, garbages and poor sanitation. Water quality is essential to safety food production, to environmental equilibrium and health of animals and humans (LISBOA, 2010).

This study aimed at pathogenesis of homeopathic preparations in electrical conductivity and pH, considering mineral water as healthy experimenter.

Materials and Methods

The experiment was carried out at the Laboratory of Homeopathy for Soil and Water, Department of Plant Science, Federal University of Viçosa, Brazil, in August 2011. The

experimental design was the completely randomized of 65 experimental plots, five replicates and thirteen treatments (*Natrum muriaticum* 7CH, *Alumina* 7CH, *Silicea* 7CH, *Carbo vegetabilis* 7CH, *Arnica montana* 7CH, *Nux vomica* 7CH, *Pyrogenium* 7CH, *Calcarea carbonica* 7CH, *Sulphur* 7CH, *Lycopodium clavatum* 7CH, Mineral Water 7CH, Control-Ethanol 20% 7CH and Control - no application).

In sixty-five borosilicate vials of 100 mL with 80 mL of mineral water, two drops of the homeopathic preparation were applied, single dose, except in the control treatment (no application), under double-blind procedure.

The homeopathic preparations (6CH) were purchased in commercial laboratory, prepared in Ethanol 20%. The homeopathic solution Mineral Water 7CH was prepared in mineral water, following the standard procedures (DÔRES et al., 2007). The mechanical arm machine performed the 100 succussions.

Electrical conductivity (CE) was measured (microsiemens per centimeter) by the conductivimeter MD-32, while pH was measured by potenciometer DM-23. The electrode was washed off by distilled water before the following reading.

The variables were measured immediately after 24 hours, 48 hours and 72 hours of treatments application. The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007), and the means were compared by Tukey test at 5% probability.

Results and Discussion

The mineral water was responsive to homeopathic

solutions, and the pathogenesis persisted throughout the experimental period (Table 1).

Table 1. Analysis of variance of pH and Electrical Conductivity (CE) data, immediatly after 24 hours (pH1 and CE1), after 48 hours (pH 2 and CE2) and after 72 hours (pH3 and CE3) of treatment application in mineral water. Viçosa / MG. 2011.

Source of Variation	**DF**	**Mean Square**					
		pH1	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Treat.	12	4.90**	19.14**	3.23**	30.24**	2.55**	75.29**
Res.	52	0.10	6.35	0.24	12.39	0.15	26.06
CV (%)		1.47	8.45	2.18	11.66	1.62	16.50

** significant at 1% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

The homeopathic preparations changed the pH of mineral water after 24 hours of application and these results persisted throughout the experimental period (Table 2). *Natrum muriaticum*, *Alumina*, *Silicea*, *Carbo vegetabilis* and *Arnica montana*, significantly increased the pH of the water compared to the control no application. *Nux vomica*, *Pyrogenium*, *Calcarea carbonica*, *Sulphur* and *Lycopodium* reduced the pH of mineral water.

Table 2 - Mean values of pH and Electrical Conductivity (CE), immediatly after 24 hours (pH1 and CE1), after 48 hours (pH 2 and CE2) and after 72 hours (pH3 and CE3) of treatment application in mineral water. Viçosa / MG. 2011.

Treatments	**pH1**	**CE1**	**pH2**	**CE2**	**pH3**	**CE3**
Natrum muriaticum 7CH	9.28A	36.30A	9.32A	38.35A	9.36A	43.64A
Alumina 7CH	8.40B	29.40B	8.36B	29.36B	8.60B	31.09B
Silicea 7CH	7.70C	29.58B	7.56C	29.64B	8.00B	30.05B
Carbo vegetabilis 7CH	7.28D	29.26B	6.94D	29.6B	7.56C	29.40B
Arnica montana 7CH	6.84E	28.98B	6.96D	29.38B	7.42DE	29.71B
Nux vomica 7CH	6.56FG	29.46B	6.80DEF	29.69B	7.26EF	30.01B
Pyrogenium 7CH	6.40GH	29.20B	6.92DE	29.74B	7.22EF	30.21B
Calcarea carbonica 7CH	6.38GH	29.32B	6.98 D	29.61B	7.16EF	28.91B
Sulphur 7CH	6.32H	29.21B	6.92DE	29.74B	7.10F	29.47B
Lycopodium 7CH	6.20HI	29.35B	6.76DEF	29.55B	7.06F	29.65B
Mineral Water 7CH	6.0I	29.37B	6.58EF	29.48B	7.04F	31.24B
Control. Ethanol 7CH	6.04I	29.65B	6.46F	29.55B	7.16F	26.56B
Control. No application	6.6EF	28.77B	6.76DEF	29.16B	7.02F	29.12B

Means followed by at least one same letter, in column, do not differ by Tukey test at 5% probability.

By comparing the pH mean of the treated water with the control Ethanol 7CH, there was no solvent effect (ethanol). However, some treatments caused changes in pH that differ significantly from the control, no application (Table 2).

The homeopathic preparation Mineral Water 7CH is named autonosode or isoterapic. The inclusion of this autonosode was due to its common use by homeopath land families. The nosodes are effective and easily accessible because they are obtained by using local resources (ANDRADE et al., 2010). However, it was observed that the Mineral Water 7CH treatment was not effective on pH, compared to control Ethanol 7CH.

In supposing the mineral water as healthy experimenter, the results imply on pathogenesis of homeopathic preparations in pH. The results indicate the potential use of homeopathic preparations to increase or decrease the pH, as necessary.

There was significant increase in electrical conductivity and pH along with 24, 48 hours and after 72 hours of *Natrum muriaticum* application. In considering the results as pathogenesis, *Natrum muriaticum* 7CH can bring back the homeostasis of diseased water with high CE. *Natrum muriaticum* 7CH increased CE as a function of time (Table 2). The results are consistent with those of Elia et al. (2006), in which the ultra diluted solution increased CE along with the experimental period. The activity of *Natrum muriaticum* in water was measured in several studies (CASALI et al., 2009). According to Andrade et al. (2011), *Natrum muriaticum* generates signals of pathogenesis in mineral water if potencies 6CH, 30CH, 100CH, 1000CH are applied but depending on the exposure of treatment. The electrical

conductivity may be considered a good indicator of water responses to homeopathic preparations. The results depend on: the stimulation effect, the exposure time of water to homeopathic preparation and the number of doses (ARAUJO et al., 2011; FIELDS et al., 2011; ROCHA et al., 2011).

The mechanism of action in Homeopathy was not well theorized, and demands more data. The results about the activity of homeopathic preparations in water are important and actually are being studied due to the presence of water in living organisms (CASALI et al., 2006).

The fact that homeopathic preparations have been dynamized to the potency 7CH means that they still contain molecules in solution, in small quantities, and that could have influenced the value of variables. However, in case of the variable CE this statement is not valid because only *Natrum muriaticum* 7CH caused significant changes. According to Lisboa (2011), the hypothesis of substance being present in the solution is the most widely argument of both biologists and pharmacologists homeopaths to explain the activity of homeopathic potencies. The response to homeopathic preparations above 12CH is the current challenge to physics researchers and chemistry scientists to be interpreted under new theory.

Conclusion

There was pathogenesis effects of homeopathic preparations in mineral water.

The pH and electrical conductivity are indicators of the effective homeopathic pathogenesis in water. Mineral water proved to be an appropriate experimenter.

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CHAPTER 7

CHANGES OF BIOCHEMICAL OXYGEN DEMAND (BOD) IN WATER TREATED WITH HOMEOPATHIC PREPARATIONS

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Keywords: Pathogenesis. Homeopathy. High Dilutions.

Introduction

Water quality is of great influence on the surface cover of the soil, also on the composition of soils and on human activities. The way that humans use and occupy land has direct implications on water quality. In general, water quality is dependent on the land use (LOUZADA et al., 2002).

The degradation of water resources through human actions, such as disposal of domestic sewage and industrial

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residues over bed rivers, affect the physico-chemical properties of the water ending up in negative impacts.

The biochemical oxygen demand (BOD), a physico-chemical property of water, is fundamental as quality marker. As defined by Lee et al. (2006), BOD is the amount of oxygen necessary to oxidize the biodegradable organic matter under aerobic conditions, or the amount of dissolved oxygen (DO) in mg/L, which is consumed by the aerobic organisms to degrade the organic matter.

The BOD is an important parameter of water quality and quantify organic pollution by oxygen consumption and anaerobic condition of the aquatic system. The dissolved oxygen in water, is important in the dynamics, the characterization and the health of aquatic ecosystems (LIMA et al., 2006).

For decades, nature has been advertising on strong signs of transition, as if waking up the new sense for human life. And it is happening so quickly that the changes are calling for new paradigms. New behaviors and demands determine new paths in natural resource management (LIMA et al., 2006). In the case of management of water resources, scarcity, misuse and increasing demand are placing the water as a serious problem for humanity in the XXI century. The diseased waters introduce sickness of many kind in organisms: plants, animals, soils and microorganisms. Agriculture depends on water quality for production of safety foods (RODRIGUES et al., 2011).

Homeopathy is a natural resource and an advanced knowledge that can transform the state of life on Earth, from polluted and diseased, to well balanced condition, organized and healthy (CASALI et al., 2002). The activity of

homeopathic preparations on self-regulation of living systems is to trigger the reaction forward equilibrium and to straighten metabolic functions to overcome the imbalances and to provide homeostasis (CASALI et al., 2006).

The homeopathic preparations also change some physico-chemical properties of water, as evidenced by Figueiredo (2009), Gomes (2009) and Lisboa (2010).

The researches in Homeopathy are initiated by the pathogenesis studies of the high diluted substances. Pathogenesis is the set of signals arised from trials on healthy organisms as long the homeopathic preparations are been applied. So they are signs, not symptons. In each experiment, the signals are carefully recorded, later analyzed and classified, building the Homeopathic Acology or the Homeopathic Acognosy, old terms but scientific terms, for the older name “Homeopathic Medical Matter”, (Materia Medica). More than 3,000 homeopathic substances have their Acology or Acognosy data published. The pathogenesis is fundamental to choose the most suitable homeopathic preparation in order to reestablish the healthy state of living systems in accordance with the principle of similarity (CASALI et al., 2006).

The objective of this study was to evaluate the pathogenesis of four homeopathic preparations in the BOD of the water.

Materials and Methods

The experiment was carried out at the Laboratory of Homeopathy for Soil and Water, Department of Plant Science, Federal University of Viçosa (UFV), Brazil, in August 2011.

The experimental design was the completely randomized of six treatments, five replicates and 30 experimental plots. The treatments were: *Calcarea carbonica* 30CH, *Magnesia carbonica* 30CH, *Silicea* 30CH, *Phosphorus* 30CH, Control 1(no application), Control 2 (Distilled Water 30CH).

The homeopathic preparations, potency 29CH, were purchased from commercial laboratory. Few minutes before the applications the homeopathic solutions 30CH were prepared in distilled water. According to Andrade (2004), in experiments on microbial activity, the ethanol, solvent commonly used in the homeopathic solutions, should be avoided due to the sensitivity of microorganisms.

Control 2 (Distilled Water 30CH) was prepared at the Laboratory of Homeopathy, Plant Science Department, UFV, following general procedures (DORES et al., 2007). The mechanical arm machine performed the 100 succussions.

Inside 30 BOD bottles of 300 mL, 50 mL of mineral water were poured over 250 mL of Dilution Water. Preparation of Dilution Water followed the methodology suggested by Fernandes (2003).

After preparation of BOD bottles the first determination of dissolved oxygen (OD initial) was done by the portable oximeter DM-4P. After the reading it was applyed the treatments of 9 drops per botlle of homeopathic preparations under the double-blind procedure. After treatment application, the samples were incubated in growth chamber at 20 ° C under light. The final reading of dissolved oxygen (DO final) was five days later. The electrode was washed off by distilled water before the following reading.

From the values of initial OD and final OD it was calculated the Biochemical Oxygen Demand (BOD). The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007) and the means were compared by Tukey test at 5% probability.

Results and Discussion

There were statistically significant changes in BOD of the mineral water (Table 1) after treatments with homeopathic preparations.

Table 1. Analysis of variance of Biochemical Oxygen Demand (BOD) data of mineral water after treatment aplications. Viçosa-MG. 2011.

Source of Variation	**DF**	**Mean Square**
Treatment	5	11.33**
Residue	24	0.84
VC (%)		7.13

** significant at 1% probability by F test
DF- Degrees of freedom
VC- Variation coefficient

The homeopathic preparations reduced the values of BOD compared to Control 1. Emphasis was of *Magnesia carbonica* 30CH, *Silicea* 30CH and *Phosphorus* 30CH because they also reduced the BOD in relation to Control 2 (Table 2).

Table 2. Mean values of Biochemical Oxygen Demand (BOD) (mg / L) in mineral water. Viçosa-MG. 2011.

Treatments	**Mean**
Control 1: no aplication	6.46A
Control 2: Destilled Water 30CH	4.80 B
Calcarea carbonica 30CH	4.74 B
Magnesia carbonica 30CH	2.98 C
Silicea 30CH	2.86 C
Phosphorus 30CH	2.66C

Means followed by same letters do not differ by Tukey test at 5% probability.

There was a reduction of BOD by Control 2 (Distilled Water 30CH), compared to Control 1. The effect of Distilled Water 30CH was statistically equal to the effect of *Calcarea carbonica* 30CH.

Distilled water was really a control since it is the main solvent of homeopathic preparations. The potency 30CH of distilled water allowed to check the effect of dynamizations (dilutions plus succussions) without solutes.

By similar responses of Distilled Water 30CH and *Calcarea carbonica* 30CH, it can be deduced on the effect of the oxygen in the bottles at the time of dynamization. It was hypothesized that *Calcarea carbonica* interferes with the oxygen in the vial at the time of succussion.

The homeopathic preparations in this experiment were selected based on previous research that proved their effect on microbial activity. According to Andrade (2004), *Calcarea carbonica*, *Magnesia carbonica*, *Phosphorus* and the *Silicea* change the activity and the efficiency of soil microorganisms.

The reduction of BOD was interpreted as a result of the higher activity of microorganisms and consequently, greater consumption of dissolved oxygen. The results are of coherence with those observed by Andrade (2004).

In basic research of homeopathy, the mineral water is assumed as a healthy experimenter, if so, the results are pathogenesis (FIGUEIREDO, 2009). The homeopathic preparations caused those pathogenesis of increase in microbial activity and in reducing growth of microorganisms.

Rodrigues et al. (2011), confirmed the increase in BOD after treatment of river water with Oxygen 30CH. The results of river water treatment were interpreted as a system reaction to the stimulus of homeopathic preparation.

Figueiredo (2009), proved that *Calcarea carbonica* 5CH increases the dissolved oxygen of water from a waterhead (spring water). However, the results were dependent on subjected time to treatments. The longer exposure time (60 hours) allowed the appearance of pathogenesis signs of *Calcarea carbonica* slowly since this homeopathic preparations is of slow activity (CASALI, 2009).

Gomes (2009) evaluated some variables of water quality as indicators of homeopathic preparations pathogenesis. The variable dissolved oxygen was not so reliable for pathogenesis studies. Dissolved oxygen in water is highly transient mainly due to light instability and temperature variation, both causing variability in the results.

Andrade (2004) proved the activity of homeopathic preparations in soil solution. The activities of homeopathic preparations in primary and secondary metabolism are known through published data of Homeopathic Acology (CASALI et

al., 2009), or Homeopathic Acognosy.

The potency 30CH of homeopathic solutions are devoid of molecules. From the 12th successive dilution plus succussion of a substance, in centesimal scale, it is impossible probabilistically the presence of original molecules from the raw material, according to Avogadro principle. The trials results with high dilutions imply on the hypothesis of some dynamic physic action of homeopathic preparations (CASALI et al., 2006).

Conclusion

The homeopathic preparations caused pathogenesis in mineral water as quantified by the variable Biochemical Oxygen Demand (BOD).

The homeopathic preparations *Calcarea carbonica* 30CH, *Magnesia carbonica* 30CH, *Phosphorus* 30CH and *Silicea* 30CH reduced the BOD of water.

The activities of high dilutions on biological properties of water are strong argument of the physical dynamic effect.

The BOD is indicated to pathogenesis research of homeopathic preparations.

Homeopathic Acognosy data are promising for water treatment by high dilutions.

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CHAPTER 8

ELECTRICAL CONDUCTIVITY OF DISTILLED WATER AFTER TREATMENT WITH *Argentum nitricum*

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Introduction

Homeopathic solutions prepared with strong substances generate effects very fast after few doses. Homeopathic preparation of weak substances must be tested by many doses. Also the activity of homeopathic preparations of weak

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substances must be investigated in more responsive and sensitive experimenters (LISBOA et al., 2005).

As reported by Gomes (2009), if more exposure time is allowed for the activity of *Calcarea carbonica* and if a greater number of doses (number of applications) is applied, then, interactions and water responses may be best performed.

The electrical conductivity of the water has been investigated as an indicator of homeopathic preparations effects (FIGUEIREDO, 2009), including homeopathic solutions of slow activity.

The aim at this study was the changes of electrical conductivity in distilled water after *Argentum nitricum* treatment and to interpret the effects according to the principles of Homeopathy.

Materials and Methods

The experiment was carried out at the Laboratory of Homeopathy, Federal University of Viçosa, Viçosa / MG (Brazil), in January 2011.

The experimental design was the completely randomized of five treatments, four replicates, 20 experimental plots (20 borosilicate vials of 80 mL containing 40 mL of distilled water). The treatments were the number of applications (doses) of the homeopathic preparation *Argentum nitricum* 7CH. Dose 0 (without application, control), Dose 1 (one application), Dose 2 (2 applications), Dose 3 (three applications) and Dose 4 (4 applications). Five drops of *Argentum nitricum* 7CH were applied per dose. The homeopathic preparation was purchased at a Laboratory of Homeopathy.

The electrical conductivity (CE) was determined by the Conductivimeter MD-32. Readings in microsiemens per centimeter were taken before treatment (CE- T0), immediately after treatment (CE- T1), after 24 hours (CE- T2), after 48 hours (CE- T3) and after 72 hours (CE- T4) of treatment application. The electrode was washed off by distilled water before the following reading. The statistical processing of data was by analysis of variance and by the mean test of Schott Knott, at 10% probability in the program SAEG 9.1 (2007)

Results and Discussion

There was statistically significant effects of the treatments after 24 hours and after 72 hours (table 1) of treatment.

The number of applications of the homeopathic preparation was effective in causing the water response. The highest dose (4 applications) increased water CE, after 24 and 72 hours of the treatment (Table 2).

The absence of significant effects at time zero (before applications) is an important feature since there is a connection between precision of experimental methodology and uniformity among the vials of distilled water used as an experimental plot. Also it is a confirmation of the hypothesis that all experimenters (vials of distilled water) were well balanced concerning the physico-chemical properties of water to conduct electrical impulses.

After the third dose the response was not as fast as the prior ones. *Argentum nitricum*, as recorded in Homeopatic

Acology, is the most related to acceleration processes. It is recommended to organisms that are imbalanced by movement or by increased metabolism (CASALI et al, 2009)

Data analysis indicate that there was consistency between the pathogenesis of *Argentum nitricum* described in Homeopathic Acology and the results of this trial. It was interpreted that the experiments on human bodies and other living organisms generates signals of great analogy to signals from water trials.

Table 1 - Analysis of variance of the electrical conductivity data before treatment (CE T-0), immediately after application (CE T-1), after 24 hours (CE T-2), after 48 hours (CE T-3) and after 72 hours (CE T-4) of treatments in distilled water. Viçosa / MG. 2011.

Source of Variation	**DF**	**Mean Square**				
		CE T-0	**CE T-1**	**CE T-2**	**CE T-3**	**CE T-4**
Treatments	3	0.0052^{ns}	0.0086^{ns}	0.093**	0.11^{ns}	0.22**
Residue	15	0.0054	0.0064	0.039	0.056	0.086
VC (%)		5.22	5.71	13.55	15.05	17.90

***significant at 5 % probability by F test

^{ns} not significant

DF- Degrees of freedom

VC- Variation coefficient

Table 4 - Mean values of electrical conductivity (µS / cm) before treatment (CE T-0), immediately after treatment (CE T-1), after 24 hours (CE T-2), after 48 hours (CE T-3) and after 72 hours (CE T-4) of treatments in distilled water. Viçosa / MG. 2011.

Treatments	**CE T-0**	**CE T-1**	**CE T-2**	**CE T-3**	**CE T-4**
No application	1,4[a]	1,38A	1,43B	1,51A	1,56B
One application	1,38[a]	1,38A	1,35B	1,47A	1,51B
Two applications	1,42[a]	1,41A	1,41B	1,54A	1,54B
Three applications	1,37[a]	1,36A	1,36B	1,51A	1,52B
Four applications	1,45[a]	1,48A	1,72A	1,87A	2,06A

Means followed by same letter, in column, do not differ significantly from each other by Schott Knott test at 10% probability.

Conclusion

The homeopathic preparation *Argentum nitricum* causes effects on the electrical conductivity of distilled water. The responses are dependent on dose and exposure time.

There are similarities between the signs of the primary action in water and the signals in human bodies.

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CHAPTER 9

PATHOGENESIS OF SEVEN HOMEOPATHIC PREPARATIONS IN THE ELECTRICAL CONDUCTIVITY OF WATER

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Introduction

The research in Homeopathy applied to living systems is started by experimentation in healthy organisms and the data generated characterize the pathogenesis (Homeopathic Acognosy), which are signals caused by the homeopathic preparation in the experimenter. The pathogenesis is the main criterion for choosing the most appropriate homeopathic preparation to each case of disfunction to straighten the organism or the living system (CASALI et al., 2006).

Mineral water is regarded as a healthy experimenter. There is great diversity among sources of water concerning physico-chemical characteristics. Electrical conductivity is the most suitable property because of the variability in soil conditions everywhere a waterhead (mine) is located.

As recommended in the protocol of homeopathic research, the experimenters should be healthy and diversified allowing complete and generalizable provings (LISBOA et al., 2005).

The objective of this study was to evaluate the pathogenesis of seven homeopathic preparations in the electrical conductivity of mineral water from two sources.

Materials and Methods

Two experiments were carried out at the Laboratory of Homeopathy, IF Southeast of Minas Gerais, Rio Pomba, Brazil, in November 2010. In both the experimental design was a completely randomized of eight treatments: *Cuprum metallicum* 7CH, *Ferrum metallicum* 7CH, *Argentum nitricum* 7CH, *Plumbum metallicum* 7CH, *Sulphur* 7CH, *Zincum metallicum* 7CH, *Arsenicum album* 7CH and distilled

water (control), five replicates, 40 experimental plots.

In forty borosilicate vials of 80 mL with 40 mL of mineral water A (electrical conductivity at 25 ° C = 16.2 μS / cm) and another 40 vials with 40 mL of mineral water B (electrical conductivity at 25 ° C = 355μS/cm) were applied five drops of the treatment, under the double-blind procedure. The homeopathic solutions of potency 7CH were prepared in distilled water few minutes before the initiation of treatments. The mechanical arm machine performed the 100 succussions.

The electrical conductivity (CE) was measured (microsiemens per centimeter) by the Conductivimeter MD-32, before the treatment (CE-T0), after 24 hours (T1-CE), after 48 hours (CE-T2) and after 72 hours (CE- T3) of the treatments. The electrode was washed off by distilled water before the following reading. The statistical processing of data was by analysis of variance in the program SAEG 9.1 (2007). The means were interpreted by Tukey test at 5% probability.

Results and Discussion

The electrical conductivity (CE) was influenced by homeopathic treatments (Tables 1 and 2). In the water "A" the signs were visible between 24 hours and 72 hours after the treatment application. In the water "B" the signs were visible after 24 hours of treatment application.

Table 1 - Analysis of variance of the electrical conductivity data before treatment (CE T-0), after 24 hours (CE T-1), after 48 hours (CE T-2) and after 72 hours (CE T-3) of treatments in mineral water "A" (16.2 µS / cm). Rio Pomba. 2010.

Source of Variation	**DF**	**Mean Square**			
		CE T-0	**CE T-1**	**CE T-2**	**CE T-3**
Treatments	7	1.28^{ns}	2.25*	2.54*	3.68*
Residue	32	0.96	0.89	0.87	1.17
VC (%)		4.69	4.59	4.53	5.26

*significant at 1% probability by F test

^{ns} not significant

DF- Degrees of freedom

VC- Variation coefficient.

Table 2 - Analysis of variance of the electrical conductivity data before treatment (CE-T-0), after 24 hours (CE T-1), after 48 hours (CE T-2) and after 72 hours (C.E T-3) of treatment in mineral water "B" (355.0 µS / cm). Rio Pomba. 2010.

Source of Variation	**DF**	**Mean Square**			
		CE T-0	**CE T-1**	**CE T-2**	**CE T-3**
Treatments	7	15.40^{ns}	126.03**	7.22^{ns}	8.86^{ns}
Residue	32	19.89	6.70	17.16	10.28
VC (%)		1.40	0.81	1.31	0.99

** significant at 1% probability by F test

^{ns} not significant

DF- Degrees of freedom

VC- Variation coefficient.

The mean values of CE before treatment (C.E- T0), indicate the uniformity of water samples (the experimenters), because there was no statistical significance among these means (Tables 3 and 4).

The mineral water samples are healthy experimenters, and the differences in electric conductivity were considered the pathogenesis. In the water "A," of lower CE (16, 2 µS / cm) there was pathogenesis between 24 and 72 hours after treatment. Cuprum metallicum 7CH increased CE of water A, this is a pathogenesis effect after 24 hours, 48 hours and 72 hours of treatment (Table 3).

After 48 hours of treatment there was a pathogenesis of Ferrum metallicum 7CH and after 72 hours the pathogenesis of Argentum nitricum 7CH, Sulphur 7CH and Plumbum 7CH (Table 3).

Table 3 - Mean values of electrical conductivity (µS / cm) before treatment (CE T-0), after 24 hours (CE T-1), after 48 hours (CE T-2) and after 72 hours (CE T-3) of treatment application in the mineral water A (16.2 µS / cm). Rio Pomba. 2010

Treatments	**CE T-0**	**CE T-1**	**CE T-2**	**CE T-3**
Control	20.50A	19.48B	19.16B	18.70B
Cuprum metallicum 7CH	22.10 A	21.84 A	21.62 A	20.88 AB
Ferrum metallicum 7CH	20.58 A	20.90 AB	21.18 A	21.28 A
Argentum nitricum 7CH	20.68 A	20.36 AB	20.66 AB	21.10 A
Plumbum metallicum 7CH	20.82 A	20.32 AB	20.68 AB	21.10 A
Sulphur 7CH	20.90 A	20.66 AB	20.90 AB	21.24 A
Zincum metallicum 7CH	20,70 A	20.82 AB	20.46 AB	20.52 AB
Arsenicum album 7CH	20.90A	20.94AB	20.52AB	20.28AB

Means followed by same letter, in column, do not differ at 5% probability by Tukey test.

In the water "B" of higher CE (355 µS / cm) pathogenesis was after 24 hours of treatment (Table 4). The homeopathic preparations increased the CE except *Cuprum metallicum*.

The signs of pathogenesis of both mineral waters A and B were well differentiated and also proved the principle of action specificity of preparations (FIGUEIREDO, 2009).

Table 4 - Mean values of electrical conductivity (µS / cm) before treatment (CE T-0), after 24 hours (CE T-1), after 48 hours (CE T-2) and after 72 hours (CE T-3) of treatment application in mineral water "B" (355 µS / cm). Rio Pomba/MG.2010

Treatments	**CE T-0**	**CE T-1**	**CE T-2**	**CE T-3**
Control	317.24A	310.16B	315.70A	322.58A
Cuprum metallicum 7CH	317.66 A	311.30 B	312.60 A	320.12 A
Ferrum metallicum 7CH	316.62 A	319.64 A	315.04 A	321.74 A
Argentum nitricum 7CH	318.06 A	319.92 A	315.52 A	322.24 A
Plumbum metallicum 7CH	319.10 A	321.38 A	314.70 A	324.34 A
Sulphur 7CH	316.98 A	321.08 A	314.60 A	321.04 A
Zincum metallicum 7CH	313.40 A	323.56 A	315.34 A	322.34 A
Arsenicum album 7CH	315.34A	321.86A	316.80A	323.54A

Means followed by same letter, in column, do not differ by Tukey test at 1% probability.

Conclusion

Homeopathic preparations caused pathogenesis in mineral water measured by electrical conductivity. The time after treatment that signs appear depend on the mineral water.

Gratefulness

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CHAPTER 10

Calcarea carbonica ACTIVITY IN WATER AS INFLUENCED BY SUCCUSSION

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Introduction

Water is essential for living organisms, agricultural production, domestic and industrial purposes (HU, 2009). Organic and inorganic wastes have been released into the environment but they are disturbing the waters that surround the cities. Frequently the organic and mineral loads exceed the water capability of self-purification (LEITE et al., 2005). Then the waters turn unsafely to many kinds of uses (domestic use, commercial, agricultural, recreation, etc). It is very important to consider the capacity of rivers. And also to prevent the release of untreated effluent in such a flow, which

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is greater than the carrying capacity.

Lima et al. (2006) defined BOD as the amount of oxygen necessary to oxidize the biodegradable organic matter in aerobic conditions. It is the amount of dissolved oxygen (DO) in mg/L, which is consumed by the aerobic organisms to degrade organic matter.

The BOD is an important parameter of water quality. BOD also quantify organic pollution by depletion of oxygen which turns anaerobic the aquatic system. The oxygen dissolved in water is important in the dynamics and the salubrity of aqueous ecosystems (LIMA et al, 2006).

Andrade et al (2011) measured the BOD in water samples treated with homeopathic preparations. There was a reduction of BOD by the homeopathic preparations *Calcarea carbonica* 30CH, *Magnesia carbonica* 30CH, *Silicea* 30CH and *Phosphorus* 30CH. It was concluded that the BOD is responsive to homeopathic treatments and also it is useful in studies of pathogenesis.

In Homeopathy, increased informations available allow diversity of treatments for living systems including the water. (ANDRADE et al, 2006). Experimentation is the fundamental principle of Homeopathic Science. Experiments give rise to results which are included in the Homeopathic Acology or Homeopathic Acognosy. By experiments it becomes known the potentials of homeopathic preparations for treatments in agreement with Similarity Principle.

According to the protocol, the homeopathic preparations should be tested in several experimenters to discover the pathogenesis of substances. Pathogenesis is the set of signals generated in the healthy organism by homeopathic

preparations. Pathogenesis signs are important in choosing the homeopathic solution most suitable for therapeutic purposes in agreement with the Principle of Similarity (RODRIGUES, 2009).

Andrade et al (2011) evaluated the pathogenesis of some homeopathic preparations in the BOD of the water. *Calcarea carbonica* 30CH and control (Distilled Water 30CH) did not differ statistically. Then, there is a possibility of the oxygen interaction with homeopathic preparations in the process of succussion. This interaction may have caused similar effects of Distilled Water 30CH and *Calcarea carbonica* 30CH (ANDRADE et al, 2011).

The objective of this research was to prove the interference of oxygen available in the bottle on the activity of *Calcarea carbonica* in water BOD.

Materials and Methods

The experiment was carried out at the Laboratory of Soil and Water Homeopathy, Department of Plant Science, Federal University of Viçosa (UFV), in 2011.

Homeopathic solutions were prepared in the Laboratory of Homeopathy / UFV, following procedures described by Dôres (2007). The homeopathic solutions were prepared in three volumes of distilled water. They were: 10 mL, 20 mL, 30 mL. The number of drops per volume was respectively: 3, 5,8.

The experimental design was a completely randomized of seven treatments, four replicates and 28 experimental plots. The treatments were: *Calcarea carbonica* 30CH in 10mL, *Calcarea carbonica* 30CH in 20 mL, *Calcarea carbonica*

30CH in 30mL, Distilled Water 30CH in 10 mL, Distilled Water 30CH in 20mL, Distilled Water 30CH in 30mL, Control (no application).

Few minutes before treatments the homeopathic solutions were prepared in distilled water. The mechanical arm machine performed the 100 succussions. Andrade (2004) reported that in experiments on microbial activity the ethanol should be avoided in the preparation of homeopathic solutions.

Inside 28 BOD bottles of 300 mL each, 50 ml of mineral water was poured over 250 mL of Dilution Water. In the preparation of Dilution Water it was followed the methodology suggested by Fernandes (2003).

After preparations of the BOD bottles the first determination of dissolved oxygen (DO initial) was done, and by the portable oximeter DM4P. The electrode was washed off by distilled water before the following reading. Soon after the reading it was applied the treatment of nine drops of homeopathic preparations per bottle, under the double-blind procedure. After treatment application, samples were incubated in the growth chamber at 20 ° C, under light. Five days latter it was the final readings of dissolved oxygen (final DO).

The values of initial DO and final DO allowed the calculations of the biochemical oxygen demand (BOD). The data were processed statistically by analysis of variance in the program SAEG 9.1 (2007). The means were compared by Tukey test at 5% probability.

Results and Discussion

The homeopathic preparations caused significant changes in the BOD of mineral water (Table 1).

Table 1. Analysis of variance of Biochemical Oxygen Demand (BOD) in mineral water samples treated with homeopathic preparations. Viçosa / MG. 2011.

Source of Variation	DF	Mean Square
Treatment	6	13.09**
Residue	21	2.83
VC (%)		35.04

significant at 5% probability by F test.
DF- Degrees of freedom
VC- Variation coefficient.

The homeopathic preparations increased BOD of mineral water. *Calcarea carbonica* 30CH (10mL and 30mL) caused the greatest BOD.

The BOD values of the volume 10mL (greater presence of oxygen) were higher when compared to other treatments. The *Calcarea carbonica* 30CH affected the BOD in accordance with the air volume available along with the succussion (Table 2).

Table 2. Mean values of Biochemical Oxygen Demand (mg / L) in mineral water treated with homeopathic preparations. Viçosa / MG. 2011.

Treatments	**Means**
Control 1: no aplication	1,7B
Control 2: Destilled Water 30CH – 10 mL	5,5AB
Control 3: Destilled Water 30CH – 20 mL	4,7AB
Control 4: Destilled Water 30CH – 30 mL	3,6AB
Calcarea carbonica 30CH – 10 mL	7,3A
Calcarea carbonica 30CH – 20 mL	4,3AB
Calcarea carbonica 30CH – 30 mL	6,4A

Means followed by same letter do not differ significantly by Tukey test at 5% probability.

Conclusion

The largest volume of air associated with the smallest volume of solvent during succussion affected the activity of *Calcarea carbonica* 30CH in BOD of mineral water.

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