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A comparative study of acid water treatment by grasses.

Un estudio comparativo del tratamiento de aguas ácidas mediante gramíneas.

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ABSTRACT

Alkaline water and other alkaline products have gained popularity in recent years, becoming a new health trend alkaline drinks. Acidic environments in the body cause several chronic illnesses, which they claim could not persist in an alkaline environment. The thinking behind this is that drinking alkaline water helps the body itself to become more alkaline, which will treat a number of illnesses, including cancer. In general, alkaline water tends to be more alkaline because it has minerals and electrolytes in it. Due to this, drinking this water after a workout or while sick may help keep minerals and electrolytes balanced and prevent dehydration. Medicinal plants are rich in several potential drugs and it carries healthier and harmless alternate to synthetic system of drugs. Plant doob/ bermuda grass (*Cynodon dactylon*) family (Graminae/Poaceae) is one of them. Doob grass is a perennial grass circulated all over the world, and particularly it is native to the high temperate and tropical regions.. It has various medicinal values and it is used in the treatment of various types of diseases in the form of various dosage forms like powder, paste or extracts. The plant of *C. dactylon* has a variety of biological activities like antiviral, antibacterial, antimicrobial and specially wound healing properties (Virmani R et al. Hidden Potential of Doob Grass- An Indian Traditional Drug. Res Pharm Health Sci.2018; 4(3). Barley grass (*Hordeum vulgare*) family (Poaceae) and doob grass taken for study to reduce the acidity from water.

Keywords: Alkaline water, grass, drinking water, acidity, pH, side effects, problems.

RESUMEN

El agua alcalina y otros productos alcalinos han ganado popularidad en los últimos años, convirtiéndose en una nueva tendencia para la salud en bebidas alcalinas. Los ambientes ácidos en el cuerpo causan varias enfermedades crónicas, que según ellos no podrían persistir en un ambiente alcalino. La idea detrás de esto es que beber agua alcalina ayuda al cuerpo a volverse más alcalino, lo que tratará una serie de enfermedades, incluido el cáncer. En general, el agua alcalina tiende a ser más alcalina porque contiene minerales y electrolitos. Debido a esto, beber esta agua después de hacer ejercicio o mientras está enfermo puede ayudar a mantener el equilibrio de minerales y electrolitos y prevenir la deshidratación. Las plantas medicinales son ricas en varias drogas potenciales y ofrecen una alternativa más saludable e inofensiva al sistema de drogas sintéticas. La familia de las plantas doob/pasto bermuda (*Cynodon dactylon*) (Graminae/Poaceae) es una de ellas. La hierba Doob es una

hierba perenne que circula por todo el mundo y, en particular, es originaria de las regiones tropicales y templadas altas. Tiene diversos valores medicinales y se utiliza en el tratamiento de diversos tipos de enfermedades en forma de diversas formas farmacéuticas. como polvo, pasta o extractos. La planta de *C. dactylon* tiene una variedad de actividades biológicas como antiviral, antibacteriana, antimicrobiana y especialmente propiedades curativas de heridas (Virmani R et al. Hidden Potential of Doob Grass- An Indian Traditional Drug. Res Pharm Health Sci.2018; 4(3) Familia de la hierba de cebada (*Hordeum vulgare*) (Poaceae) y la hierba doob tomadas para estudio para reducir la acidez del agua.

Palabras clave: Agua alcalina, pasto, agua potable, acidez, pH, efectos secundarios, problemas.

INTRODUCTION

Water is one of the most and an important element for life. It has the important ability to dissolve many other substances. Water contains various types of parameters which creates the water basic characteristics. Physical, Chemical and biological properties of water set the water quality. Drinking water and other water-based drinks of varying pH levels may play a role in a few different health factors.

Alkaline drinks may offer some health benefits comparative to acidic. The body strictly regulates its pH levels. Changes in the body's internal pH, such as blood pH, can mean serious problems in the organs and tissues. So, if it were possible to change the body's pH using food and drink, it would be dangerous to do so. The pH of water for drinking or for use in the home is very important. Water that is too alkaline or too acidic can damage pipes and appliances, and it is generally unhealthful to drink. Water naturally varies between about 6.5 and 8.5 on the pH scale, and this is normal. Water that is too far outside this scale may not be safe to drink.

IMPACTS OF ACIDIC WATER

It's not recommended to drink acidic water, as its high acidity and concentration of heavy metals can have several negative health consequences like:

May contain heavy metals: One of the main concerns with acidic water is that it often contains high amounts of heavy metals. In particular, acidic water can be high in lead, arsenic, copper, nickel, cadmium, chromium, and zinc. This is concerning, as exposure to heavy metals can be dangerous, potentially leading to heavy metal poisoning and toxicity, symptoms of which include the following: nausea and vomiting, diarrhea, abdominal pain, chills, weakness, shortness of breath, suppression of the immune system, organ damage etc.

The severity of these side effects depends on several factors, including age, sex, individual susceptibility, and the route, dose, and frequency of exposure. Children, in particular, have been shown to have more severe side effects from heavy metal exposure, including an increased risk of developmental delays, respiratory issues, behavioral disorders, certain forms of cancer, and heart disease.

Effects on teeth: The pH of food and beverages plays an important role in your overall dental health. In particular, tooth enamel — the hard, outer surface of your teeth that protects it against decay — is susceptible to

damage from acidic beverages. While acidic groundwater hasn't been studied specifically, beverages with a pH of 4.5 or less have been shown to increase the risk of tooth decay. As such, regularly drinking acidic water may slowly erode your tooth enamel, causing cavities.

Effects on bone health: Consuming acidic water has been claimed to prevent calcium absorption and lead to bone loss over time. Yet, research hasn't shown that the pH of your diet significantly affects our risk of bone loss, nor has it consistently shown that drinking alkalized water has a protective effect. However, exposure to certain heavy metals, including lead, cadmium, arsenic, and chromium, has been linked to negative side effects for bone health. Therefore, regular exposure to acidic water that's high in these heavy metals may have negative effects on bone health over time.

Damage the plumbing in the houses: In addition to harming human body, acidic water can corrode pipes. Due to its high acidity, water with a low pH can start to dissolve metal pipes over time, causing leaks and further increasing the presence of heavy metals in drinking supply. Pipes may be experiencing corrosion due to acidic water include blue-green stains on faucets or in sink, metallic-tasting water, and pinhole leaks in plumbing.

MATERIALS AND METHODS

In the study acid sample collected from printing and dyes industry adjoining residential area at Govindpura, Sanganer, Jaipur. Chaksu, Jaipur. The experiment was performed in 500 ml glass beakers with 100 ml of acidic water sample. Introduce 1gm of individual fresh doob grass into 100 ml acidic water and allowed to stand for 1 hr,2 hr,3 hr and 24hrs in the first phase. The pH of water sample was measured by using digital pH meter before and after the addition of grass. All the experiments were conducted at room temperature (about 28^{o}C). The variation of acidity of water with respect to contact time with grass. In the second phase sample was treated with 1gm Barley grass in 100 ml of water for 1 hr, 2 hr, 3 hr and 24hrs.

Samples have been collected in the month of August 2022.

Observation Table:1

	pH Value before treatment	pH Value after treatment for 1 hrs.	pH Value after treatment for 2 hrs.	pH Value after treatment for 3 hrs.	pH Value after treatment for 24 hrs.
Sample water	3.50	4.0	4.07	4.27	6.23

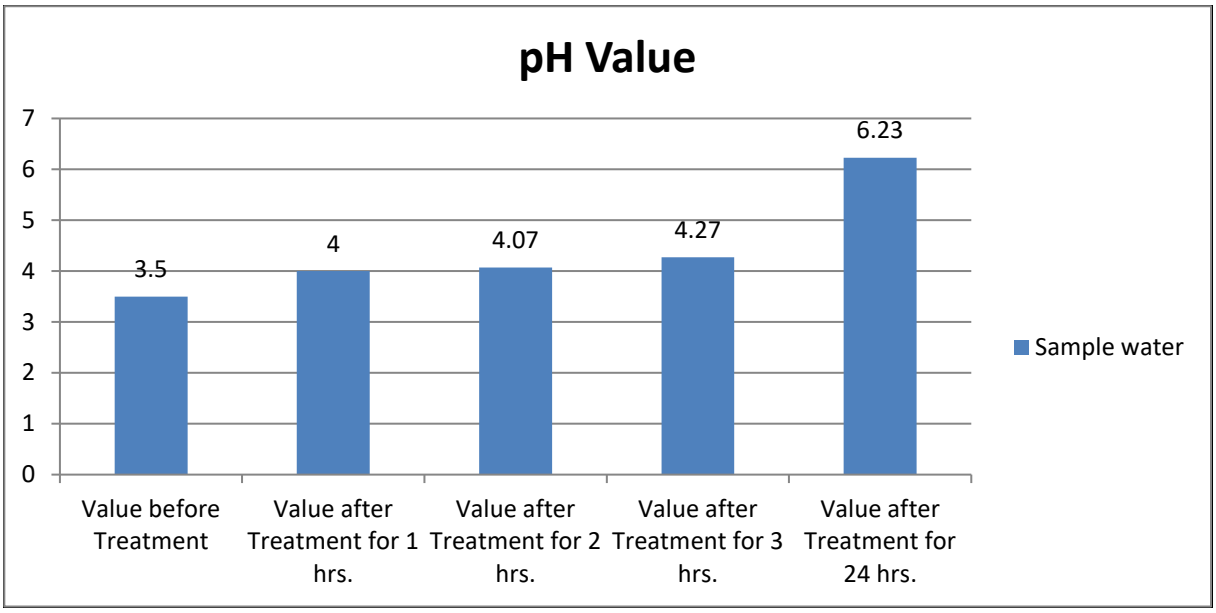

Figure: 1 pH Value after treated with doob grass in various times

Observation Table:2

	pH Value before treatment	pH Value after treatment for 1 hrs.	pH Value after treatment for 2 hrs.	pH Value after treatment for 3 hrs.	pH Value after treatment for 24 hrs.
Sample water	3.50	3.78	3.92	4.00	6.12

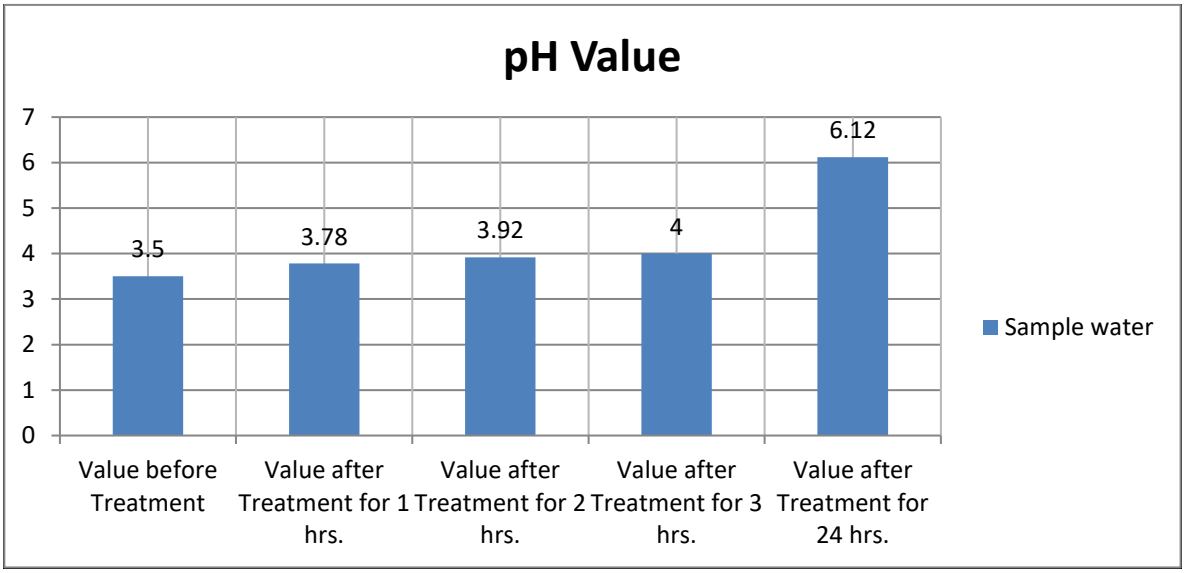

Figure: 2 pH values after treated with barley grass in various times

As conclusion, the study shows the P^H of water can be increases after the treatment with grass and barley grass. It has been observed in the study P^H decreases or we can say acidity reduces when the contact time of grass with water till 24hrs in place of 1-3hrs but below 2 P^H water cannot be treated by grass because grasses burn due to high acidity of water. From the observation tables and figures shows better result found from doob grass in place of barley grass.

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