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OPTIMIZATION OF THE WATER SUPPLY SYSTEM IN THE COMMUNITY OF JARAQUIEL, MONTERÍA-COLOMBIA, USING MORINGA OLEIFERA AS COAGULANT AND ENDOCARPIO OF COCO NUCIFERA TO OBTAIN ACTIVATED CARBON

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ABSTRACT: Córdoba is one of the most productive departments in Colombia, generating a population growth towards urban areas, increasing the demand in the services of potable water and basic sanitation, however, the efforts and the public investments made at national, departmental and municipal level , To date show great inequality in the provision of public services, between urban and rural areas of the department, such is the case of the district of Jaraquiel that does not have this service, which seeks to potabilize water with natural products Such as Moringa Oleifera as a coagulant and Cocos nucifera, benefiting approximately 1,253 community members.

INTRODUCCTION

The raw water contains a number of suspended solids and dissolved particles which must be removed in the potabilization, as they are responsible for the turbidity and color of the water [1]. The removal of each of these particles is carried out by conventional agents used in coagulation, are metal salts such as aluminum sulfate, ferric chloride and ferrous sulfate. Without shipping these chemicals can be replaced by natural products such as *Moringa Oleifera* and coconut endocarp, one as a coagulant and the other as activated carbon. The *Moringa Oleifera* plant has presented in great studies great removal of turbidity as a coagulant in the treatment of water purification (Mendoza I, 2000). Also the endocarp of the coconut according to bibliographic references has presented positive results like activated carbon.

OBJECTIVE

Optimization of the wáter supply system in the community of Jaraquiel, Montería-Colombia, using moringa oleifer as coagulant and encocarpio of coco nucifera to ontain activited carbón

METHODOLOGY

Appropriation phase

RECOGNITION	SOCIAL APPROPRIATION	OPTIMIZATION PHASE OF THE DRINKING SYSTEM
•Visit to aqueduct ACUEDEJAR •Qualitative analysis.	•Linking the community to the project. • Implementation of a schedule of activities. • Moringa oleifera crops by the community and research group. • Collection of coconut husk by the community. • Environmental education campaigns to the community by the research group.	• Improvement of aqueduct infrastructure. • Activities aimed at the technification and improvement of the process of water quality. • Alternative treatment of water with natural product.

Phase of Optimization of the system of

RECOGNITION	Physicochemical analysis
• Location of the catchment point of the drinking water treatment plant • Previous characterization of water quality at the point of reference	. Sampling of water at the aqueduct catchment point (ACUEDEJAR) . Follow the Colombian standard of drinking water and natural. . Seed collection for natural water treatment . Collection of Cocos nucifera for trials.

DISCUSSION

Appropriation phase

It shows the acceptance and active linkage to the project by the entire beneficiary community, in turn has understood the need for the operation of a the wather treatment plant, which will benefit them with the provision of water suitable for human consumption at a low cost , Using natural raw materials supplied by the previous crops of the natural product.



. The Research Group on Applied Environmental Sciences "GICAP" and the community of the district of Jaraquiel intend to disseminate this project can be replicated in other communities.

. The implementation of the project with community support is one of the policies established by IDEAS FOR CHANGE BIO 2016, whose purpose is "Support innovative solutions from science and technology that carry out processes of social appropriation of knowledge

Phase of Optimization of the system of purification

SETTINGS	M1 RESULT	M2 RESULT	M3 RESULT	UNITY	MAXIMUM PERMISSIBLE NATURAL	MAXIMUM VALUE PERMISSIBLE DRINKING WATER- MAXIMUM
pH	7,56	7,12	7,19	U de pH	5,0-9,0	6,5 y 9,0.
Conductivity	112	112	111	µS/cm	...	1000
Total hardness	50,47	55,6	54,6	mgCaCO3/L	...	300
Chlorides	5,57	6	4,6	mgCl/L	250.0	250
Alkalinity	39,6	38,8	41,4	mgCaCO3/L	...	200
Temperature	26,9	26,9	26,9	°C	...	...
Nitrates	<0,2	<0,2	<0,2	mgN- NO3/L	10	10
Color	50	48	50	UPC	75	15
Turbidity	113	87,1	88,6	NTU	10	2
Sulfates	28,41	24,65	19,85	mgSO4/L	400	250
Phosphates	0,05	0,07	0,09	mgP-PO4/L	...	0,5
Total match	0,88	0,1	0,13	mgP/L	...	...
Total Dissolved Solids, SDT	62,72	62,72	62,16	mgSDT/L	...	...
Total Suspended Solids, SST	73,6	99,2	81	mgSST/L	...	...
Sedimentary Solids	0,5	0,5	0,6	mgSS/L	...	...
Biochemical Oxygen Demand, BOD5	<2,0	<2,0	<2,0	mgO2/L	...	...
Chemical Oxygen Demand, COD	29,78	23,16	23,16	mgO2/L	...	...
Dissolved Oxygen, OD	5,79	5,95	5,8	mgO2/L	...	...
Total Coliforms	283	299	295	UFC/100 mL	20000	...
Fecal coliforms	125	128	127	UFC/100 mL	2000	...

. The results of physicochemical analyzes have yielded results corresponding to the acceptable quality of the natural source.

. The application of Decree 1594 of 1984, corresponding to maximum values permissible for natural water yield results where the water quality of the Sinu River is acceptable.

. The water quality assessment of the Sinú River, under RESOLUTION 2115, for drinking water, qualifies water conditions as not acceptable for human consumption.

. The expansion of the water supply system is fundamental to meet the expectations of the community.

CONCLUSION

. The participation of the staff of the community of Jaraquiel integrated by the community, indigenous chapter Zenu Xaraquiel, Communal Action Board is active in the execution of the project.

. According to the physicochemical analysis carried out and following the Colombian standards for drinking water and natural, it can be concluded that the water of the Sinú River is of acceptable quality, but not suitable for human consumption, therefore it is necessary to treat it.

. In relation to the current regulations (RESOLUTION 2115 OF 2007 FOR DRINKING WATER), the physico-chemical analyzes carried out on the water distributed by the community aqueduct show that it is not suitable for human consumption, which leads to the immediate adaptation of the water supply system.

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