126 - PHYSICOCHEMICAL AND MICROBIOLOGICAL QUALITY OF THE DRINKING WATER OF THE ACADEMIES OF PHYSICAL ACTIVITIES IN THE CITY OF PATOS, PARAÍBA, BRAZIL

DILERMANDO SIMÕES DANTAS;
ALEXANDRE JOSE MORAIS DOS SANTOS,
KENNYA MOREIRA RODRIGUES
Laboratório de Bromatologia da Vigilância Sanitária do Município de Patos, Paraíba, Brasil.
dilermandosdantas@ig.com.br
doi: 10.16887/85.a2.126

INTRODUCTION

Essential to the health and development of all living beings, to water, required in all metabolic processes, including protein synthesis in diet with high protein content, in addition to the removal of toxins and metabolic waste from the body, how to remove the excess nitrogen, urea and ketone bodies, however, when the water does not provide suitable conditions for consumption is an indispensable product to health to be a vehicle of pathologies, highlighting the diarrheal diseases that can be associated erroneously to other foods.

Waterborne diseases comprise a wide range of gastrointestinal pathologies caused by bacteria, protozoa and viruses and according to the World Health Organization (WHO) 80% of diseases in developing countries are caused by contaminated water (COELHO et al., 2007).

So that does not present health risk and is suitable for human consumption, in addition to presenting water features as being clear, odorless and tasteless, needs to be considered a drinking water, namely, treated, clean and free of contaminants (PEREIRA et al., 2009).

Notably, part of the water supplied to users of services of academies, are not acquired specifically for drinking, but, in many cases, are collected from faucets and placed in troughs. Another fact that calls to attention, is not cleaning of reservoirs (water tower) with the minimum frequency every six months, as recommended by the sanitary organs besides the existence of still uncapped reservoirs to ensure the safety of the liquid.

GOAL

The present study aimed to assess the microbiological and physico-chemical quality of the water that is consumed in the troughs of the academies of physical activity in the city of Patos, Paraíba, Brazil, through color parameters, pH and turbidity and the presence of total coliforms and Escherichia coli.

METHODOLOGY

The analysis of the water was held in the month of September and October 2014, in 13 of the 26 academies of physical activities in the city of Patos, Paraíba, Brazil, with a total of 13 samples from water fountains.

For the collection of samples from the water fountains was a formula one race held on tap asepsis using 70% alcohol, drained the water for 30 seconds and after this procedure were collected in sterile plastic bags for collecting (Nasco WHIRL-PAK), being transported in isothermal container with ice gelox type recycled and sent to lab for analysis the same day of the gathering.

The analyses were performed in the laboratory of the Municipal sanitary vigilance Bromatology Patos, according methodological specifications laid down by the Standard Methods for the Examination of Water and Wastewater, and physico-chemical analyses in respect of colour, turbidity and pH, in addition to the research of total coliforms and Escherichia coli.

Photo 1-used for Laboratory analyses of water quality.

Source: the author

For the bacteriological analysis adopted the technique of cromogen and Colilert ®-fluorogênico, where is added a blister pack of the substrate to 100 ml of sample, homogenized and incubated by 12 h at 37ºc. Is a technique that relies on metabolic reactions of total coliforms on enzymatic substrates acquiring yellow coloration. E. coli develop ultraviolet light fluorescence (BURGOS, 2012).

Photo 2-cromogen and fluorogênico for examination for the presence of total colifome and e. coli in the water.

Source: the author

The use of the chromogenic substrate method allows determining both total coliforms and e. coli present in a given sample being qualitative method, adopted by the National Health Foundation for analysis of drinking water, according to the American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

For determination of turbidity was used the Turbidímetro (Digimed), where samples of water were placed on the glass buckets of device that makes reading providing the results in nefelométrica until (NTU). The method is based on comparison of the intensity of light diffused by the sample being considered acceptable until 5 NTU (BRASIL, 2011).

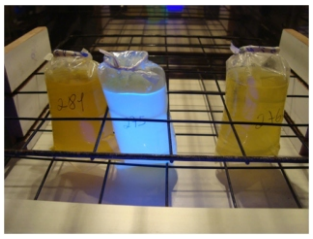
The pH of the samples was determined by direct reading in pH meter (Quimis), being recommended according the 2,914 Concierge/11, which is in the range between 6.0 and 9,5.

As for color, the determination is made by visual comparison of the sample with distilled water. We used the visual comparator with disc (Aquatest Nessler Number 200) to provide directly the color value expressed in units of color, being acceptable values less than 15 uH (Hansen units).

RESULTS AND DISCUSSION

Of the 13 samples of water taken from the academies troughs of Patos, ParaÍba, Brazil, only one was positive for total coliforms and none has been detected the presence of e. coli. As for the physical-chemical parameters of color. pH and turbidity, all samples were within the norms established by the Ministry of health (table 1).

Photo 3-Water with a yellowish coloration, indicating the presence of total coliforms and fluorescence, indicating contamination by e. coli using the technique of cromogen and fluorogênico.



Source: the author

Table 1-physical-chemical and microbiological Parameters of water of water fountains of the academies of physical activities in the city of Patos-PB.

Academy	Total coliforms	*E.coli*	Color	Turbidez	pH	Results
Academy 1	-	-	5	0,01		satisfactory
Academy 2	-	-	5	0,05		satisfactory
Academy 3	-	-	5	0,01		satisfactory
Academy 4	+	-	5	0,23		Unsatisfactory
Academy 5	-	-	5	0,13		satisfactory
Academy 6	-	-	5	0,07		satisfactory
Academy 7	-	-	5	0,13		satisfactory
Academy 8	-	-	5	0,05		satisfactory
Academy 9	-	-	5	0,01		satisfactory
Academy 10	-	-	5	0,13		satisfactory
Academy 11	-	-	5	0,01		satisfactory
Academy 12	-	-	5	0,11		satisfactory
Academy 13	-	-	5	0,21		satisfactory

Comparing the results obtained in this work with other studies conducted to assess the microbiological quality of drinking water in other types of institutions (Oliveira; Earth, 2004), in Uberaba-MG, Zulpo et al. (year?). In Guarapuava-PR, (2006); Sesay et al. in Recife, (2010), it is observed that, samples evaluated in the troughs of the academies presented bacteriological and physicochemical quality however, require greater attention by authors involved in the activity, not ruling out the need for constant monitoring of the quality of water available in the troughs on the part of supervisory bodies such as the Health and Environmental Surveillance, as well as greater attention of the physical education professionals and users of the services.

Dantas et al., (2012) evaluating the quality of collected water from the taps and consumed by urban population of Patos-PB contamination found around 22.64% of the samples in the year 2011.

CONCLUSION

The quality of the waters of the troughs of the academies depends on simple measures of cleaning of reservoirs and taps to avoid the risks of water-borne transmission diseases, so that services that lend themselves to maintaining and/or improving the quality of life, is not accompanied by potential users, being essential to maintain a program of monitoring of the microbiological quality of water consumed by the population.

REFERECES

AMERICAN PUBLIC HEALTH ASSOCIATION. Standard Methods for the examination water and wastewater. 19. ed. Washington: American Public Health Association, 1995.

BRASIL. Fundação Nacional de Saúde. Manual técnico de análise de água para consumo humano. Brasília: Funasa, 1999..

BURGOS, T. N.; PELAYO, J. S.; SECO, B. M. S. Avaliação bacteriológica das águas de bebedouros do campus da Universidade Estadual de Londrina – PR Semina: Ciências Biológicas e da Saúde, Londrina, v. 33, n. 2, p. 193-200, jul./dez. 2012

COELHO, D. A.; SILVA, P. M. F.; VEIGA, S. M. O. M.;FIORINI, J. E. Avaliação da qualidade microbiológica de águas minerais comercializadas em supermercados da cidade de Alfenas, MG. Revista Higiene Alimentar, São Paulo, v. 21, n. 151, p. 88-92, 2007.

OLIVEIRA, A. C. S.; TERRA, A. P. S. Avaliação microbiológica das águas dos bebedouros do campus I da faculdade de medicina do Triângulo Mineiro, em relação à presença de coliformes totais e fecais. Revista da Sociedade

Brasileira de Medicina Tropical, Rio de Janeiro, v. 37, n. 3, p. 285-286, 2004.

PEREIRA, M. C.; SILVA, A. A. A.; GASTÃO, T. A. A.; CARVALHO, T. S.; IMADA, K.

S.; CAMARGO, L. M. A (2009). Estudo da potabilidade de água para consumo no bairro triângulo e vila candelária, Porto Velho - Rondônia - Brasil. Revista Saber Científico, Porto Velho, v. 2, n. 1, p. 28-36.

SIQUEIRA, L. P.; SHINOHARA, N. K. S.; LIMA, R. M. T.; PAIVA, J. E.; FILHO, J. L. L.; CARVALHO, I. T. Avaliação microbiológica da água de consumo empregada em unidades de alimentação. Ciência & Saúde Coletiva, Rio de Janeiro, v. 15, n. 1, p. 63-66, 2010.

ZULPO, D. L. et al. Avaliação microbiológica da água consumida nos bebedouros da universidade estadual do Centro-Oeste, Guarapuava, Paraná, Brasil. Semina: Ciências Agrárias, Londrina, v. 27, n. 1, p. 107-110, 2006.

Rua Titico Gomes, 23, Bairro Bela Vista
Patos, Paraíba, Brasil

PHYSICOCHEMICAL AND MICROBIOLOGICAL QUALITY OF THE DRINKING WATER OF THE ACADEMIES OF PHYSICAL ACTIVITIES IN THE CITY OF PATOS, PARAÍBA, BRAZIL

ABSTRACT

Water is an essential element for the human being, but it could be a potential route of transmission of diseases by pathogenic microorganisms on serving all the contamination by fecal material. As important as the physical activity and a healthy diet, water intake with quality must be taken into account in our daily lives, in this sense, sought to evaluate the physico-chemical and microbiological quality of water intended for human consumption in waterers gymnastics academies in the city of Patos, Paraiba, Brazil. Water samples were collected from water fountains in 13 of the 26 academies registered by the Municipal health surveillance, being the samples analysed in the laboratory of food science health surveillance itself, following the provisions of Ordinance No. 2914/2011, the ANVISA (Ministry of health), which considers that water intended for human consumption must be free from Escherichia coli and total coliforms in 100 ml, color less than 15 UH, less than 5 NTU turbidity and pH between 6,0 and 9,5. The results obtained show a prevalence of 7,69%, for the period of September and October 2014.

KEYWORDS: water; Water Cooler; Contamination; Academies.

QUALITÉ PHYSICO-CHIMIQUE ET MICROBIOLOGIQUE DE L'EAU POTABLE DES ACADÉMIES D'ACTIVITÉS PHYSIQUES DANS LA VILLE DE PATOS, PARAIBA, BRÉSIL

RÉSUMÉ

L'eau est un élément essentiel pour l'être humain, mais ça pourrait être une voie potentielle de transmission de maladies par des microorganismes pathogènes sur desservant toute la contamination par des matières fécales. Aussi important que l'activité physique et une alimentation saine, prise d'eau de qualité doit être tenu compte dans notre vie quotidienne, en ce sens, a cherché à évaluer la qualité physico-chimique et microbiologique des eaux destinées à la consommation humaine dans les académies de gymnastique abreuvoirs dans la ville de Patos-PB. Échantillons d'eau ont été prélevés des fontaines d'eau dans 13 des 26 académies enregistrés par le Conseil Municipal de la santé, étant que les échantillons analysés dans le laboratoire de la surveillance de santé science alimentaire lui-même, conformément aux dispositions de l'ordonnance no 2914/2011, l'ANVISA (ministère de la santé), qui estime que les eaux destinées à la consommation humaine doit être exempt de Escherichia coli et des coliformes totaux par 100 mL, couleur moins de 15 UH, moins de 5 de turbidité NTU et de pH compris entre 6,0 et 9,5. Les résultats obtenus montrent une prévalence de 7,69 %, pour la période allant de septembre et octobre 2014.

MOTS-CLÉS : eau ; Refroidisseur d'eau ; Contamination ; Académies.

CALIDAD FÍSICO-QUÍMICA Y MICROBIOLÓGICA DEL AGUA POTABLE DE LAS ACADEMIAS DE ACTIVIDADES FÍSICAS EN LA CIUDAD DE PATOS, PARAIBA, BRASIL

RESUMEN

Agua es un elemento esencial para el ser humano, pero podría ser una potencial vía de transmisión de enfermedades por microorganismos patógenos en el servicio a toda la contaminación por materia fecal. Tan importante como la actividad física y una dieta saludable, la ingesta de agua con calidad debe tenerse en cuenta en nuestra vida cotidiana, en este sentido, procurado evaluar la calidad físico-química y microbiológica de aguas destinadas al consumo humano en las academias de gimnasia de bebederos en la ciudad de Patos – PB. Se recolectaron muestras de agua de las fuentes de agua en 13 de las 26 academias registradas por el Patronato Municipal de salud, siendo que las muestras analizadas en el laboratorio de vigilancia en salud ciencia alimentaria, siguiendo las disposiciones de la Ordenanza Nº 2914/2011, la ANVISA (Ministerio de salud), que considera que el agua destinada al consumo humano debe estar libre de Escherichia coli y coliformes totales en 100 mL, color menos de 15 UH, turbidez inferior a 5 NTU y pH entre 6.0 y 9.5. Los resultados obtenidos muestran una prevalencia de 7,69%, durante el período de septiembre y octubre de 2014.

PALABRAS CLAVE: agua; Enfriador de agua; Contaminación; Academias

QUALIDADE MICROBIOLÓGICA E FISICO-QUÍMICAS DA ÁGUA DE BEBEDOUROS DAS ACADEMIAS DE ATIVIDADES FÍSICAS DO MUNICÍPIO DE PATOS, PARAIBA, BRASIL

RESUMO

A água é um elemento essencial ao ser humano, mas pode ser uma potencial via de transmissão de doenças pela veiculação de microrganismos patogênicos sobre tudo pela contaminação por material fecal. Tão importante quanto á atividade física e uma alimentação saudável, a ingestão de água com qualidade deve ser levada em consideração no nosso dia a dia, neste sentido, buscou-se avaliar a qualidade físico-química e microbiológica da água destinada ao consumo humano de bebedouros das academias de ginásticas do município de Patos – PB. Foram colhidas amostras de água de bebedouros em 13 das 26 academias cadastradas junto a Vigilância Sanitária Municipal, sendo as amostras analisadas no Laboratório de Bromatologia da própria Vigilância Sanitária, seguindo as normas da Portaria nº 2914/2011, da ANVISA (Ministério da Saúde), a qual considera que a água para consumo humano deve ser isenta de Escherichia coli e coliformes totais em 100 mL, cor menor que 15 UH, turbidez menor que 5 NTU e pH entre 6,0 e 9,5. Os resultados obtidos demonstram uma prevalência de 7,69%, para o período de setembro e outubro de 2014.

PALAVRAS-CHAVE: Água; Bebedouro; Contaminação; Academias.