



Parasitological analysis of vegetables in a community garden in Teresina

Análise parasitológica de hortaliças de uma horta comunitária em Teresina

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Artigo

Abstract: Vegetables are important for public health, as they may contain protozoan cysts, eggs and larvae of helminths, serving as an important channel for the transmission of enteroparasitosis. Objective: This study aimed to investigate the presence of enteroparasites in some vegetables grown in the community garden. Prince Geovane, in the East Zone of Teresina, Piauí. Method: Ten parts of each plant were collected and analyzed by the methods of Hoffmann and Modified Ritchie, to verify protozoan cysts, eggs and larvae of helminths. Results: In material analyzed by the Ritchie method, as parasite forms were found in 3 of them, as well as in 8 analyzed by the modified Hoffmann method. Conclusion: The result revealed weaknesses in the control of contaminating factors of vegetables, requiring corrective interventions.

Key words: Parasitic diseases. Vegetables. Lettuce. Coriandrum. Brassica.

Resumo: As hortaliças são de suma importância para a saúde pública, pois podem conter cistos de protozoários, ovos e larvas de helmintos, servindo como um importante canal de transmissão de enteroparasitose. Objetivo: Pesquisar a presença de enteroparasitos em algumas hortaliças (alface americana, coentro e couve) da horta comunitária Geovane Prado, na Zona Leste de Teresina, Piauí. Método: Foram coletadas dez porções de cada hortaliça que foram analisadas pelos métodos de Hoffmann e Ritchie Modificado, para verificação de cistos de protozoários, ovos e larvas de helmintos. Resultados: No material analisado pelo método de Ritchie, foram encontradas formas de parasitos em 3 deles, bem como em 8 analisados pelo método de Hoffmann modificado. O resultado encontrado revela fragilidades no controle dos fatores contaminantes das hortaliças, necessitando de intervenções corretivas.

Palavras-chave: Parasitoses. Hortaliças. Alface. Coentro. Repolho.

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Introduction

Vegetables are important and indispensable foods in the human diet because of their nutrient content, such as minerals, dietary fibers and vitamins, in addition to their antioxidant action. Generally, vegetables are eaten raw, with lettuce and watercress being among the most used by the population (SILVA et al., 2005; SANTOS et al., 2004; GREGÓRIO et al., 2012).

However, consumers are exposed to the risk of acquiring enteroparasitosis infections by consuming these inadequately sanitized foods that can carry protozoan cysts, as well as eggs and helminth larvae (SIMÕES et al., 2001).

Several studies have revealed the possibility of transmission of enteroparasitoses to humans through foods consumed "in natura", among them giardiasis, amebiasis, ascariasis, teniasis, strongyloidiasis, hookworm and schistosomiasis. The consequences are diarrhea, anemia, hemorrhage and nutritional imbalances (ESTEVEZ et al., 2009; GREGÓRIO et al., 2012).

Contamination of vegetables by parasites can occur at various points in the production chain. Irrigation with contaminated water, the planting of soils containing human waste and the contact with animals that have free access to the vegetable gardens (TAKAYANAGUI et al., 2006).

Although the ideal consumption of vegetables by the Brazilian population is low, studies indicate that 23.9% of the population consume them regularly, which is a large contingent (JAIME et al., 2009). The Department of Rural Development (DRD), an organ linked to the Teresina City Hall, administers 57 community gardens, occupying 1,883 lots.

This study aimed to verify the presence of helminth and protozoan forms in vegetables collected in a community garden in the eastern zone of Teresina, capital of Piauí.

Method

This study is a cross-sectional field research with quantitative approach to verify the possible presence of protozoan cysts, as well as eggs and larvae of helminths in greenery of the Geovane Prado Community Garden, located in the eastern zone of Teresina, capital of State of Piauí. According to the Department of Rural Development (SDR), the garden has an area of 2.8 hectares and 81 lots, and was founded in 1988 by the Municipality of Teresina, which currently has 57 of these gardens totaling 1,883 lots. Parasitological examinations were performed at the Laboratory of Parasitology of the Integrated Health Center (CIS) of the University Center UNINOVAFAPI.

The vegetables selected for analysis were lettuce, coriander and cabbage, as they

were the most commercialized. Three lots of the community garden were selected, where 3 samples from lot 1, 4 samples from lot 2, 3 samples from lot 3 of each type of vegetable were selected, totaling 10 lettuce samples, 10 cabbage samples and 10 coriander samples. Samples were selected in good condition, showing green coloration. Vegetables with rotten leaves, bruised, with yellowish appearance and presence of microorganisms visible to the naked eye were excluded. The parasitological analyzes of the vegetables were carried out according to the method of Hoffmann and Modified Ritchie, used to verify cysts of protozoa, eggs and larvae of helminths.

Due to its simple execution and low cost, as well as its efficiency in the detection of helminth eggs and larvae, we used the method of spontaneous sedimentation of Hoffmann, Pons & Janer (1934). We also used Ritchie's method modified by Régis Anécimo (MRMRA) to detect helminths and protozoa in samples. The Eco-Logic Kit was used to collect and analyze the samples.

In the microscopic analysis, the samples were analyzed using the 10x and 40x objective. The results were presented through tables and data processing involved simple statistics through the Excel 2013 worksheet.

Results and discussion

Each group of ten samples of each vegetable was analyzed by the two methods, totaling 60 samples analyzed, and 11 samples

(18.33%) were contaminated with parasite forms, as shown in Table 1. Lettuce and cabbage had a contamination of 6.67% each, followed by a contamination of 5% of coriander.

Analyzing each method separately, in 30 analyzed samples, the Hoffmann method found contamination in 8 of them (26.7%), while the Ritchie method found 10% contamination in the same samples. Eggs of *Ascaris* and *Taenia sp* were found in both methods, whereas the Hoffmann method found cysts of hookworm. All species found cause public health problems for humans.

According to Falavigna & Faria (2005), lettuce and cabbage are vegetables with propensity to a high degree of contamination because of the shape of their leaves, which are multiple and separated, and with a large area of contact, allowing greater adhesion of certain enteroparasites.

Concerning cabbage, we found an average contamination of 20%, close to 10% found by Dufloth et al (2013) and 9.5% in a study by Esteves & Figueiroa (2009), but far from 63.6 % found by Silva et al (2015) and 100% discovered by Bento et al (2011).

The mean contamination of coriander samples was 15% (10% by Ritchie and 20% by Hoffmann). Esteves & Figueiroa (2009) used the Hoffmann method to analyze this vegetable and found 19% contamination, similar to the result of our study, but Morais (2011) found a contamination of 97.9%,

almost equal to that found in the study of Oliveira et al. (2016).

As we can see, the different degrees of contamination that we find when comparing our results with those of other studies may be due to different methodologies used in each of them.

According to Morais (2011) the contamination does not depend on the

vegetable, as suggested to Falavigna & Freitas (2005) previously, but from the cultivation process to the consumer. Gregório et al (2012) reported that the main factors that influence the contamination of vegetables before harvesting are a use of organic fertilizers, water and soil contaminated.

Table 1- Parasitological analysis of vegetables collected at the Geovane Prado Community Garden, Teresina, April 2017.

		Ritchie Modificado	Hoffman Modificado
Lettuce	Number of samples	10	10
	Contaminated samples	1	3
	Found forms	<i>Taenia</i> eggs	Larvae of Hookworm <i>Taenia</i> eggs
Cabbage	Number of samples	10	10
	Contaminated samples	1	3
	Found forms	<i>Ascaris</i> eggs	<i>Ascaris</i> eggs
Coriander	Number of samples	10	10
	Contaminated samples	1	2
	Found forms	<i>Ascaris</i> eggs	Larvae of Hookworm <i>Taenia</i> eggs

Source: Direct Search.

The 20% contamination of the lettuce with forms of parasites that we found are close to the 23% found by Esteves & Figueiroa (2009). Montanher (2007) and Esteves & Figueiroa (2009) found respectively 10% and 58% of contamination in this vegetable.

Conclusion

In view of the results, the poor hygienic-sanitary conditions of the studied vegetables grown in the community garden Geovane Prado, southeast of Teresina, are verified, necessitating corrective measures to enable the in natura consumption of these vegetables. Studies are also needed covering other community gardens in our city.

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