Trypanosoma cruzi infection in acai pulps produced in Acre, Brazil

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The WHO ranking of pathogens responsible for foodborne diseases in 2014 shows Trypanosoma cruzi in 10th place, evidencing the importance of oral transmission in cases of acute Chagas disease. Among the foods involved in oral acute Chagas disease outbreaks, acai was responsible for most of the cases, with frequent occurrence in the northern region of Brazil. This study aimed to show T. cruzi investigations in samples of acai pulp produced in Feijó city, Acre. These investigations were done, since occurred an outbreak of acute Chagas disease in Feijó city. In August 2016, Instituto Adolfo Lutz (Sao Paulo, Brazil) received 5 different lots of acai pulp for T. cruzi investigation. Samples (50 g) were centrifuged for 10 min at 2,500 g. Pellets and supernatants (500 µL) were used for DNA extraction, that were done using DNA QIAamp DNA Stool Mini Kit (Qiagen), according to the manufacturer’s instructions. The 5 acai pulp samples were positive in real time PCR. These results were determined since previous methodology standardization was made. Parasite detection in foods presents many difficulties, especially acai pulp. The problem most often linked to DNA extraction include contamination by phenols and polysaccharides, among others. The chemical characteristics of acai contribute to different types of inhibition reducing the efficiency of the reaction. According to acai viscosity, DNA samples were extracted using a kit for use in stool samples (DNA QIAamp DNA Stool Mini Kit). This kit permitted removing inhibitors present in acai samples (as in stool samples). Presently, many commercial kits are available for extracting DNA from different matrices, but only a limited number can be used for DNA purification from processed food products. Another critical point in the development of an effective method for detecting pathogens in foods is the minimum quantity of sample used in diagnosis. The prescribed quantity of clinical samples used in molecular diagnosis for different diseases is well standardized. However, in foods, until now, there is no consensus. Recent studies described different quantities of aliquots for use in tests. Thus, for analyses in this study, the aliquots must contain around 50g, since the parasite distribution normally is not homogeneous. In addition, large quantities of suspected foods linked to outbreaks are sent to laboratories to be tested. Thus, larger aliquots allow for a greater chance of detecting the parasite in the sample. In conclusion, this was the first time that a molecular method was used to search for T. cruzi in food as a tool to clarify an outbreak of oral acute Chagas’ disease. These data could confirm the epidemiological data and to conclude that the case of acute Chagas disease investigated occurred, in fact, due to the consumption of T. cruzi infected acai pulp.

Keywords: Trypanosoma cruzi, outbreak, acai pulp, real-time PCR