ANTIOXIDANT AND CARDIOPROTECTIVE EFFECTS OF FERMENTED EXTRACTS OF *Theobroma grandiflorum* (COPOAZÚ)

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PPAF 23

Within the biological activities of some functional foods, the action against Reactive Oxygen Species (ROS) is highlighted, the own products of cellular reactions and indispensable in the regulation of different metabolic pathways. The significant increase of ROS produced by imbalances between their formation processes and the antioxidant defense system generates oxidative stress. This oxidative damage seems to be involved in aging, and in several degenerative diseases related to it, such as cardiovascular diseases (CVD), cataracts, cognitive dysfunctions and cancer [2]. To avoid this type of pathologies, the World Health Organization (WHO) recommends the regular practice of physical activity and consumption of a balanced diet, taking into account the properties of functional foods such as fruits and vegetables rich in polyphenols or other bioactive molecules [3]. The Cupuassu (*Theobroma grandiflorum*) is a fruit species belonging to the Amazon region, its beans have been used in a similar way to cocoa beans in chocolate or other derived products [1]. Phytochemical studies have shown that Cupuassu pulp and beans contain potent antioxidant polyphenols including flavones, flavan-3-ols and proanthocyanidins, related to positive health effects [4,5]. Considering the foregoing, the objective of this research was to evaluate the effect of Cupuassu fermented extracts with possible therapeutic potential.

The cupuassu beans were fermented for ten days, then an aqueous extraction was prepared for each sample taken at intervals of two days, it was frozen and lyophilized.

The qualitative and quantitative analysis of the chemical composition of the extracts of the fermented beans of cupuassu were carried out using colorimetric methods and HPLC. The evaluation of the antioxidant activity of the extracts was performed using colorimetric methods (DPPH, FRAP, superoxide radical and peroxynitrite anion) and electrochemical, using cyclic voltammetry. Also, the cardioprotective effect was assessed using the ischemia and reperfusion model of rat isolated heart using the Langendorff system. During the fermentation process of the cupuassu bean, changes in polyphenolic composition were observed, these variations were statistically correlated with changes in antioxidant activity. The polyphenolic content, and the antioxidant activity at day ten of the fermentation process, was lower than at the beginning of the fermentation process. The experimental results showed that the fermented, dry and roasted extract at day ten, reduces the post-ischemic alterations of myocardial function and oxidative damage generated by the process of ischemia and reperfusion. The cardioprotective mechanisms of the extract are dependent on the activity of the enzyme nitric oxide synthase. This study demonstrates for the first time, the cardioprotective action of an aqueous extract *T. grandiflorum* in a model of ischemia and reperfusion revealed in the decrease of the infarct size, the increasing post-ischemic recovery and decrease of oxidative damage observed in the isolated heart. For the reasons set out above, the data provided by this research indicate that the cupuassu extract at day ten, fermented, dry and roasted, has antioxidant and cardioprotective effects, this fact potentially converts this fermented, dried and roasted extract of *T. grandiflorum* in a dietary option at consumption.

References

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