The Berry Fruit Açai (Euterpe oleracea Mart): Bringing Health Benefits and Exotism to the Modern Table

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INTRODUCTION

The palm Amazonian fruit açai (Magnoliophyta: Arecaceae, Euterpe oleracea Martius) has been applied in folk medicine. Nowadays, this exotic berry fruit is commonly used to make beverages (i.e. juices) and food preparations (e.g. ice creams).

Açai is widely distributed in northern South America where it is traditionally consumed. In the recent years, açai has gained popularity abroad as a food and functional ingredient. It has then considerable both nutritional and economic importance (e.g. exportation). This is mainly due to both its content in bioactive molecules beneficiating health.

Indeed, considerable research has been made on the fruit’s pulp of açai. Some highlights include: (i) the relatively high presence of certain polyphenols (e.g. flavonoids especially proanthocyanins and, in a lesser extent, anthocyanins such as cyanidin 3-glucoside and cyanidin 3-rutinoside) as well as in carotenoids, ascorbic acid (aka vitamin C)4-8; (ii) the subsequent relatively strong anti-oxidant activity (e.g. scavenging of free Radical Oxygen Species (ROS) such as superoxide (O$_2^-$) and peroxyl (ROO$^-$) radicals,4,6-7,9 which is discussed to contribute to the prevention of several inflammatory-state diseases (e.g. non-communicable pathologies such as diabetes, arthritis, cancers). In fact, it is commonly accepted that açai fruit represents an interesting functional food for disease prevention and therapy, and one of the berry fruits (along with blueberry and cranberry) that display the most anti-oxidant potency.10

HEALTH BENEFITS OF THE ACAI FRUIT

Preventive and Therapeutic Effects

Açai’s health benefits are based on consistent experimental studies that range from cells (e.g. microglial, cancer cells) to animal models (e.g. flies, rodents, zebrafish). Nevertheless, there is still a paucity of reports using different parts of the açai fruit other than the pulp, and so, the assessment of their comparative effects in humans is not relevant yet.

Briefly, this exotic “super food” is recognized for its potential against:

(i) Inflammation (e.g. inhibition of NF-κB activation and MAPK pathway; inhibition of Cyclooxygenase (COX) 1/2 activities);11-14

(ii) Aging (i.e. increased longevity in flies submitted to a high Saturated Fatty Acid (SFA) diet or deficient in enzymatic anti-oxidants such Superoxide Dismutase 1 (SOD1); dermatological care against disorders such as psoriasis, atopic dermatitis; cosmetic care);15-19

(iii) Cancers (e.g. induced apoptosis of leukemia cells; prevention of chemically-induced esophageal, bladder, or colon cancer in rodents);20-22

(iv) Cardiovascular disease (i.e. vasodilatation effect mediated by Nitric Oxide (NO)/cyclic
CONCLUSIONS: CHALLENGES AND PROSPECTS

Açai is a valuable functional food for healthcare. Likewise for resveratrol,\textsuperscript{42,43} considered as the most potent anti-oxidant, the nanoencapsulation of açai extracts, açai blends or pure açai-based alkaloids might improve the clinical outcome in patients with specific health conditions (e.g. skin disorders, inflammatory diseases). Nano-açai products may also be valuable for the development of innovative cosmetics. Eventually, human experiments from both açai extracts and derived-bioactive pure chemicals are requested in order to precisely evaluate their respective molecular effects in disease prevention, diagnosis and therapy as well in esthetics (e.g. açai-based cream formulations). If it is proven that açai extracts or derived pure molecules effects are valuable in humans, then it should be used in a routine clinical setting. Indeed, studies in rodent models are invaluable for understanding the potential cellular mechanisms for the pathogenesis of insulin resistance,\textsuperscript{44} and genomic responses in mouse models poorly mimic human inflammatory diseases.\textsuperscript{45,46} An explanation is that, in terms of evolution, large mammals display a lower mass-specific basal metabolic rate (m-BMR in g/ml of O\textsubscript{2} per h) when allometrically compared with small ones (e.g. human species showed a 93.6% decrease in mass-specific basal metabolic rate compared with the mouse species).\textsuperscript{47,48} Therefore, rather than over-relying on animal models to understand what happens in humans, isn’t time to embrace the human ‘model’ to move forward?

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