1: J Agric Food Chem. 2006 Nov 1;54(22):8604-10
Antioxidant capacity and other bioactivities of the freeze-dried Amazonian palm berry, Euterpe oleraceae mart. (acai).
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The fruit of Euterpe oleraceae, commonly known as acai, has been demonstrated to exhibit significantly high antioxidant capacity in vitro, especially for superoxide and peroxyl scavenging, and, therefore, may have possible health benefits. In this study, the antioxidant capacities of freeze-dried acai fruit pulp/skin powder (OptiAcai) were evaluated by different assays with various free radical sources. It was found to have exceptional activity against superoxide in the superoxide scavenging (SOD) assay, the highest of any food reported to date against the peroxyl radical as measured by the oxygen radical absorbance capacity assay with fluorescein as the fluorescent probe (ORACFL), and mild activity against both the peroxynitrite and hydroxyl radical by the peroxynitrite averting capacity (NORAC) and hydroxyl radical averting capacity (HORAC) assays, respectively. The SOD of acai was 1614 units/g, an extremely high scavenging capacity for O2*-, by far the highest of any fruit or vegetable tested to date. Total phenolics were also tested as comparison. In the total antioxidant (TAO) assay, antioxidants in acai were differentiated into "slow-acting" and "fast-acting" components. An assay measuring inhibition of reactive oxygen species (ROS) formation in freshly purified human neutrophils showed that antioxidants in acai are able to enter human cells in a fully functional form and to perform an oxygen quenching function at very low doses. Furthermore, other bioactivities related to anti-inflammation and immune functions were also investigated. Acai was found to be a potential cyclooxygenase (COX)-1 and COX-2 inhibitor. It also showed a weak effect on lipopolysaccharide (LPS)-induced nitric oxide but no effect on either lymphocyte proliferation and phagocytic capacity.
PMID: 17061840 [PubMed - indexed for MEDLINE]
1: Int J Food Sci Nutr. 2005 Feb;56(1):53-64
Total oxidant scavenging capacities of Euterpe oleracea Mart. (Açaí) fruits.
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The antioxidant capacities of 11 commercial and non-commercial samples of Euterpe oleracea Mart. (açaí) fruit pulp were studied with the total oxidant scavenging capacity assay in a modified and automated version against three reactive oxygen species. The antioxidant capacities of all purple açaí samples were found to be excellent against peroxyl radicals, good against peroxynitrite and poor against hydroxyl radicals compared with common European fruit and vegetable juices recently analysed. In all cases the correlation between sample concentration and antioxidant capacities was non-linear. The antioxidant capacities against all three reactive oxygen species of the fruit pulp from one white açaí variety were very low. The phenolic compounds in purple açaí fruit pulp were identified by high-performance liquid chromatography-mass spectrometry, and the two major anthocyanins, cyanidin-3-glucoside and cyanidin-3-rutinoside, were quantified by high-performance liquid chromatography-visible spectrometry. The contributions of the anthocyanins to the overall antioxidant capacities of the fruit were estimated to be only approximately 10%. Obviously, compounds not yet identified are responsible for the major part of the antioxidant capacities of the açaí fruit pulp.
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1: J Agric Food Chem. 2006 Nov 1;54(22):8598-603
Phytochemical and nutrient composition of the freeze-dried amazonian palm berry, Euterpe oleraceae mart. (acai).

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Euterpe oleraceae is a large palm tree indigenous to the Amazon River and its tributaries and estuaries in South America. Its fruit, known as acai, is of great economic value to native people. In this study, a standardized freeze-dried acai fruit pulp/skin powder was used for all analyses and tests. Among many findings, anthocyanins (ACNs), proanthocyanidins (PACs), and other flavonoids were found to be the major phytochemicals. Two ACNs, cyandin 3-glucoside and cyanidin 3-rutinoside were found to be predominant ACNs; three others were also found as minor ACNs. The total content of ACNs was measured as 3.1919 mg/g dry weight (DW). Polymers were found to be the major PACs. The concentration of total PACs was calculated as 12.89 mg/g DW. Other flavonoids, namely, homoorientin, orientin, isovitexin, scoparin, and taxifolin deoxyhexose, along with several unknown flavonoids, were also detected. Resveratrol was found but at a very low concentration. In addition, components including fatty acids, amino acids, sterols, minerals, and other nutrients were analyzed and quantified. Total polyunsaturated fatty acid, total monounsaturated fatty acid, and total saturated fatty acids contributed to 11.1%, 60.2%, and 28.7% of total fatty acid. Oleic acid (53.9%) and palmitic acid (26.7%) were found to be the two dominant fatty acids. Nineteen amino acids were found; the total amino acid content was determined to be 7.59% of total weight. The total sterols accounted for 0.048% by weight of powder. The three sterols B-sitosterol, campesterol, and sigmasterol were identified. A complete nutrient analysis is also presented. Microbiological analysis was also performed.
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1: Vascul Pharmacol. 2007 Feb;46(2):97-104. Epub 2006 Sep 1
Endothelium-dependent vasodilator effect of Euterpe oleracea Mart. (Açaí) extracts in mesenteric vascular bed of the rat.
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Açai (Euterpe oleracea Mart.) a fruit from the Amazon region, largely consumed in Brazil is rich in polyphenols. Experiments were undertaken to determine whether hydro-alcoholic extract obtained from stone of açaí induces a vasodilator effect in the rat mesenteric vascular bed precontracted with norepinephrine (NE) and, if so, to elucidate the underlying mechanism. Açai stone extract (ASE, 0.3-100 microg) induced a long-lasting endothelium-dependent vasodilation that was significantly reduced by N(G)-nitro-l-arginine methyl ester (l-NAME) and (1)H-[1,2,3] oxadiazolo [4,4-a] quinoxalin-l-one (ODQ) and abolished by KCl (45 mM) plus l-NAME. In vessels precontrated with NE and KCl (45 mM) or treated with K(Ca)(+2) channel blockers (charybdotoxin plus apamin), the effect of ASE was significantly reduced. However this effect is not affect by indomethacin, glybenclamide and 4-aminopiridine. Atropine, pyrilamine, yohimbine and HOE 140 significantly reduced the vasodilator effect of acetylcholine, histamine, clonidine and bradykinin, respectively, but did not change the vasodilator effect of ASE. In cultured endothelial cells ASE (100 microg/mL) induced the formation of NO that was reduced by N(G)-nitro-l-arginine (l-NA, 100 microM). The present study demonstrates that the vasodilator effect of ASE is dependent on activation of NO-cGMP pathway and may also involve endothelium-derived hyperpolarizing factor (EDHF) release. The vasodilator effect suggest a possibility to use ASE as a medicinal plant, in the treatment of cardiovascular diseases.
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1: J Agric Food Chem. 2006 Feb 22;54(4):1222-9

Açai (Euterpe oleracea Mart.) polyphenolics in their glycoside and aglycone forms induce apoptosis of HL-60 leukemia cells.
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The effects of açai polyphenolics on the antiproliferation and induction of apoptosis in HL-60 human leukemia cells were investigated. Interactions between anthocyanins and non-anthocyanin-polyphenolics in both their glycosidic and their aglycone forms were also investigated to determine additive or nonadditive responses. Polyphenolic fractions at 0.17-10.7 microM were found to reduce cell proliferation from 56 to 86% likely due to caspase-3 activation (apoptosis). Anthocyanin and polyphenolic fractions were nonadditive in their contribution to the cell antiproliferation activity. At equimolar concentrations, the glycosidic forms of phenolic acids and flavonoids induced a higher magnitude of change in cell parameters (proliferation and apoptosis) than their respective aglycone forms, while the opposite trend was observed for anthocyanin aglycones. This study demonstrated that açai offers a rich source of bioactive polyphenolics and confirmed the importance of investigating whole food systems when evaluating the potential health benefits of individual phytochemical compounds.
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1: J Agric Food Chem. 2004 Mar 24;52(6):1539-45
Phytochemical composition and pigment stability of Açai (Euterpe oleracea Mart.).
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Anthocyanin and polyphenolic compounds present in açai (Euterpe oleracea Mart.) were determined and their respective contribution to the overall antioxidant capacity established. Color stability of açai anthocyanins against hydrogen peroxide (0 and 30 mmol/L) over a range of temperatures (10-30 degrees C) was also determined and compared to common anthocyanin sources. Additionally, stability in a model beverage system was evaluated in the presence of ascorbic acid and naturally occurring polyphenolic cofactors. Cyanidin 3-glucoside (1040 mg/L) was the predominant anthocyanin in açai and correlated to antioxidant content, while 16 other polyphenolics were detected from 4 to 212 mg/L. Red grape anthocyanins were most stable in the presence of hydrogen peroxide, while açai and pigments rich in acylated anthocyanins displayed lower color stability in a temperature-dependent manner. In the presence of ascorbic acid, acylated anthocyanin sources generally had increased color stability. Açai was recognized for its functional properties for use in food and nutraceutical products.
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