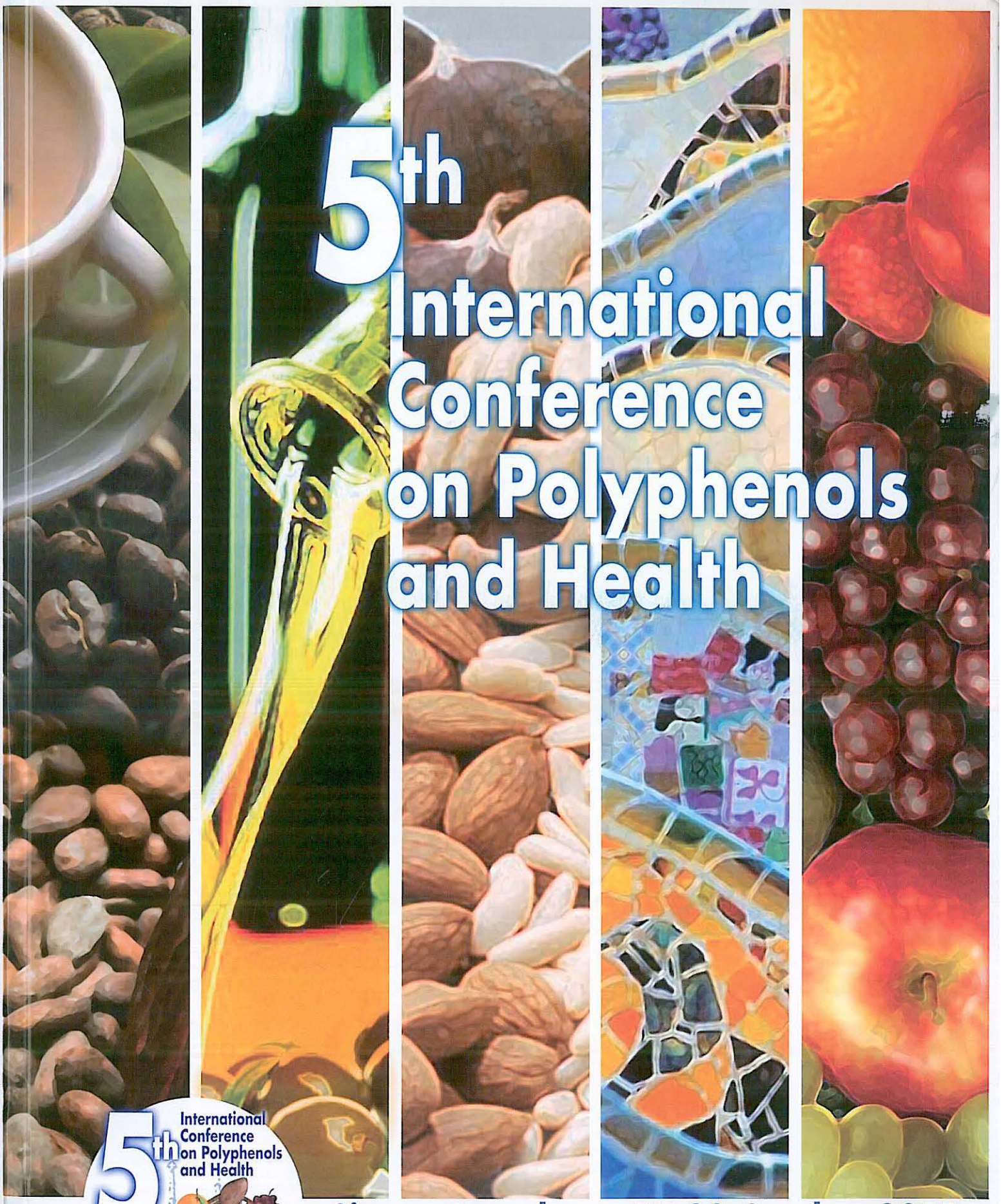

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LIKING OF ANTHOCYANIN-RICH FRUIT JUICES AND SMOOTHIES IN CHILDREN AND ADOLESCENTS: RESULTS OF SENSORY EVALUATIONS IN THE DONALD STUDY

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Objectives: Intake of anthocyanin-rich foods is supposed to be preventive against CVD and cancer. To establish a healthy diet already in childhood it is important to provide health-promoting, well-liked food products. Therefore it is of fundamental interest to examine which anthocyanin-rich fruit juices or smoothies are favoured by children and adolescents and whether the mixing with anthocyanin-free but popular apple juice may influence the acceptance of anthocyanin-rich juices.
Methods: Within the scope of the joint project ANTHONIA (coordination Prof. Dr. Clemens Kunz, University of Giessen) in 2010 an additional module was introduced in the observational "Dortmund Nutritional and Anthropometric Longitudinally Designed (DONALD) study" running at the Research Institute of Child Nutrition in Dortmund, Germany. Subsequent to their yearly anthropometric examination 331 subjects aged 4 to 17 evaluated anthocyanin-rich products. Hedonic evaluations included preference and acceptance tests with anthocyanin-rich juices and smoothies made of anthocyanin-rich grapes and blueberries as well as mixtures with apple juice. Products had been produced and analysed by Geisenheim Research Center, Section Wine Analysis and Beverage Technology.
Results: 71% of the subjects preferred pure apple juice to apple-blueberry juice. Mixing with apple juice did not influence acceptance of anthocyanin-rich grape-blueberry juice. Grape-blueberry were rated higher than apple-blueberry mixtures, the latter containing less anthocyanins and sugar. Smoothies were richer in anthocyanins than juices, but were liked less. There were no differences in liking due to age or sex.
Conclusions: In this sensory evaluation study anthocyanin-rich grape-blueberry juice was well accepted by children and adolescents and would therefore be a promising source of anthocyanins. But to give recommendations concerning a health-promoting juice it is important to take into account sugar content and amount consumed.
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POLYPHENOLIC CONTENT, IN VITRO AND IN VIVO ANTIOXIDANT CAPACITY OF 6 MEDITERRANEAN RED GRAPE POMACE VARIETIES

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Grapes are well known to contain polyphenols which can be found not only in wines in large quantities but also in pomaces, the solid waste part composed of seeds and skins after the wine-making process. Phenolic compounds which remain in pomaces could provide useful products such as food additives or nutraceuticals with a high antioxidant potential. Indeed the antioxidant activity conferred by phenolic compounds is linked to some health benefits such as playing a chemopreventive role in cardiovascular and degenerative diseases. Therefore, the aim of this study is to valorize wine by-products from six Vallée-du-Rhône red wine cultivar (Grenache, Syrah, Carignan, Mourvèdre, Counoise and Alicante) in order to produce nutraceuticals which treat hypertension. First of all, pomace antioxidant activity as well as phenolic contents and profiles were established using four antioxidant tests (ABTS+ DPPH, FRAP and ORAC) and HPLC-UV-Fluo respectively. Then, in vivo activity of the selected fractions with highest antioxidant capacity was studied in spontaneously hypertensive rats (SHR rat model) in order to highlight their biological effect on hypertension. Our first results showed that pomace seed extracts contain considerably higher amounts of total polyphenols than skins extracts and consequently presented a higher antioxidant capacity. Moreover, HPLC-UV-Fluo analyses revealed an appreciable amount of monomeric and oligomeric proanthocyanindins as well as anthocyanins (glucosides, acetylated glucosides and coumaroylated glucosides) despite the vinification process. Extracts from Grenache and Syrah conferred the highest antioxidant capacity. The efficiency of grape pomace extracts was tested on an SHR animal model. First results showed a significant antihypertensive effect in SHR rats fed with Syrah and Grenache extracts.

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ANTIOXIDANT ACTIVITY AND POLYPHENOLS CHARACTERIZATION OF IN VIVO AND IN VITRO GROWN CORIANDRUM SATIVUM

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Coriandrum sativum L. is a source of a variety of polyphenols and other phytochemicals, related to its high antioxidant activity and to its use for indigestion, rheumatism, prevention of lipid peroxidation damage [1]. Plant cell cultures are a means to study or to produce some active metabolites such as polyphenols. This technique was applied to the production of coriander, and a detailed analysis of individual polyphenols and antioxidant activity of in vivo and in vitro grown samples was performed. In vivo grown samples were vegetative parts and seeds obtained in a local supermarket. In vitro grown samples were two clones (with phenotypical stability) differentiated after 6 months in culture [2]: clone a showing a notorious purple pigmentation on vegetative parts and clone B being just green. The antioxidant activity was accessed by scavenging effects on DPPH radicals, reducing power, inhibition of carotene bleaching and inhibition of lipid peroxidation in brain cells homogenates by TBARS assay. Polyphenols analysis was carried out by reversed-phase HPLC-DAD-ESI/MS. The in vivo vegetative parts showed the highest antioxidant activity and quercetin-3-0 rutinoside as the main polyphenol. In vivo seeds revealed only phenolic acids and derivatives. In vitro samples also gave promising antioxidant activity and a high diversity of polyphenols, being apigenin-C-hexoside-C-pentoside the main compound. Anthocyanins were only found in clone A, which is certainly related to its purple pigmentation. In vitro culture can be used to explore new industrial, pharmaceutical and medicinal potentialities.
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MATRIX EFFECTS ON THE TUMORAL CYTOTOXICITY OF GREEN TEA-DRINK ENRICHED WITH BROCCOLI

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Introduction: The daily intake of fruits and vegetables is highly recommended for a healthy lifestyle. Among the healthy vegetable foods broccoli has raised as rich in bioactive phytochemicals including glucosinolates, phenolic compounds (hydroxycinnamic acids and flavonols), closely linked with the reduction of cancer risk and incidence. Green tea infusion is a beverage that also contains anticarcinogenic compounds, mainly represented by catechins. In this study we have evaluated compounds present in green tea and with enriched broccoli and their potential for antitumoral activity.
Methods and materials: The distinct compounds taking part of the phytochemical content of the prepared beverages were identified by HPLC-PAD-ESI-MSn and quantified by HPLC-PAD. The Caco-2 and CCD-18Co cell lines were exposed to 0.2%-5% conditioned media with green tea, broccoli concentrates, and 1:1 (w:w) mixtures. The time-dependent cytotoxicity of the half-maximal inhibitory concentration (IC50) on the tumoral cell line was also achieved. Cell death was evaluated by trypan blue dye exclusion that allowed studying the potential of the phytochemicals for antitumoral effect.
Results: A specific cytotoxic effect on Caco-2 cells was observed when the cells were incubated with the prepared infusions. However, a more efficient cytotoxic effect was recorded on cells treated with teas prepared on the mixture of broccoli and green tea than on cells exposed to control infusions.
Conclusion: Broccoli added additional health-promoting compounds to the green-tea beverage matrix that is of interest for its biological activity and the development of functional foods.