



## # BSP-CPD-2016-HT193 Summary

SUMMARY REVIEW

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Title	Phytochemicals and their effects on human health
Abstract	<p>The knowledge about the medicinal properties of natural products, including their action as healthy diet promoters, are widely recognized. Currently, the evidences that natural matrices possess specific bioactive properties, afforded by their chemical constituents, have become increasingly clear for the scientific community. Nevertheless, evidences from clinical trials and epidemiologic observations are still demanded, namely regarding the ideal time of the treatment and doses of the selected species. Regardless of the increasing recognition of natural matrices health evidences, a higher prevalence of chronic and degenerative diseases have been observed as a direct consequence of the undergoing socioeconomic improvement.</p> <p>The fact that natural matrices are a source of bioactive compounds, such as polyphenols, vitamins, carotenoids and unsaturated fatty acids, stimulates its usage in several areas. In addition to the benefits associated with its direct use in the food industry, they may be used as ingredients in the formulation of functional foods, nutraceuticals and in the pharmaceutical industry, for the production of natural drugs (representing a significant portion of the global pharmaceutical market production). Due to the chemical, nutritional and medicinal properties of these matrices, in recent years there has been an increasing interest in exploring their applications in health disorders conventionally treated with chemically synthesized products. These therapeutic properties associated to the fact that natural products have fewer adverse or side effects have triggered various scientific studies aiming to validate the use of biologically active substances that can be extracted from these valuable natural sources and justify the worthiness of the ongoing and future research in this field.</p> <p>In this special issue "Phytochemicals and their effects on human health" those aspects have been reviewed. The revision performed by Capuano, Dekker, Verkerke and Oliviero, evaluates the role of glucosinolates (GLSs) and, more importantly, of their breakdown products (BPs) in both food and pharmacological perspectives. The authors have summarized the liberation, absorption, distribution, metabolism, and excretion (LADME) of GLSs and BPs, reviewing the evidences for health benefit and toxicological /anti-nutritional effect from GLS consumption both in epidemiological and clinical studies, and deliberate about potential mechanisms of action that are responsible for those effects [1].</p> <p>Caleja, Ribeiro, Barreiro and Ferreira reviewed recent data on the sector of functional foods and nutraceuticals, highlighting the particular usage of phenolic compounds as bioactive in</p>

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redients, either in functional foods or in nutraceutical formulations. Examples of products already available in the market were also discussed [2].

Pérez-Gregorio and Simal-Gándara evaluated the influence of bioactive food components on health outcomes [3]. They also reviewed recent trends in the characterization of the polyphenol-protein complexes, the different analytical techniques used, the reactivity of the different polyphenols according to the structure-activity relationship and the effects of these interactions in food quality [4].

The review article presented by Amarowicz and Pegg summarizes the findings to date of both in vitro and in vivo studies using foods or phenolic extracts isolated from foodstuffs in the inhibition of the incidence of LDL oxidation [5].

Sokovic, Cirić, Glamoclija and Skaltsa, reviewed the up to date literature on the biological properties of sesquiterpene lactones from *Centaurea* species, including antimicrobial, anti-tumor, antiviral, anti-inflammatory and cytotoxic properties. They also revised the methodologies applied to extraction, isolation and structural elucidation and of lactones as purified compounds [6].

The revision performed by Pereira, Barros and Ferreira intended to provide information concerning the variations on the definition of dietary supplements, the allowable substances on it, as well as the marketing and labelling requirements among the USA and the EU legislation [7].

Souza, Correa, Andréia, Soares, Bracht, Peralta reviewed the nutritional and therapeutic uses of *Agaricus blazei* in the last decade giving special attention to the most recent discoveries regarding its chemical composition and clinical investigations [8].

Cámara, Fernández-Ruiz, Morales and Sánchez-Mata reviewed fiber compounds, such as oligosaccharides (namely  $\alpha$ -galactosides and fructans), arabinoxylans and  $\beta$ -glucans and the usage of these components by the food industry [9].

Petropoulos, Gioia and Ntatsi revised the organosulfur compounds of vegetable origin, mainly vegetable species belonging to *Allium* genus and Brassicaceae family, and their health effects. The authors reported the chemical composition, biosynthetic pathways and the mechanisms of action involved in their health effects [10].

The revision performed by Dietz and Dekker deals with an interesting theme about the effects of green tea phytochemicals, namely epigallocatechin gallate (EGCG), L-theanine and caffeine on mood and cognition performance [11].

The continuous research on natural products can lead to the new generation of food products, and will certainly promote their medicinal application, being this special issue very supportive in this matter. The use of nutraceuticals in the prevention and treatment of diseases is considered a powerful strategy by several public health authorities due to its potential in maintaining and promoting human health, longevity and life quality. Today, nutraceuticals represent a growing segment of the food industry, and undoubtedly the nutritional therapy will take advantage of its beneficial effects. Moreover, natural products have continued to be significant sources of drugs and lead compounds, being approximately 60% of the anticancer agents and 75% of the drugs for infectious diseases derived from natural products or derivatives, which confirms its prevailing role and importance. Therefore, natural products have become interesting food components due to their increasing interest in the concept of "Functional Foods" with "Health benefits".

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