Biomedicine & Preventive Nutrition 4 (2014) 439–444

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Original article

The total antioxidant content and radical scavenging investigation on 17 phytochemical from dietary plant sources used globally as functional food

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ARTICLE INFO

Article history:
Received 1st March 2014
Accepted 10 March 2014

Keywords:
Plant foods
Ascorbic acid
Gallic acid
Tocopherol

ABSTRACT

In search to potent natural antioxidant from plant-based metabolites, a comparative study was designed in present investigation. The antioxidant activity of various phytochemicals listed in text was determined by using 1,1-diphenyl-2-picrylhydrazyl (DPPH), ferric reducing power assays (FRAP) and phosphomolybdenum complex method. The level of the antioxidant activity by all three used assays was significantly ($P < 0.001$) higher in vitamin E, ascorbic acid, curcumin, gallic acid, ellagic acid, β-carotene and ursolic acid than other. Hence, these should be regarded as a potential source of natural antioxidants and could be effectively employed as an ingredient in functional food.

1. Introduction

Natural antioxidants present in foods have attracted considerable interest in public domain because of their presumed safety and potential nutritional and therapeutic effects [1]. Free radicals and reactive oxygen species have been implicated in the induction of various types of oxidative damage to biomolecules that result several pathological events in living organisms [2]. These free radicals can induce changes in different biological tissues and cell biomolecules such as lipids, proteins, DNA or RNA [3]. Free radicals can also affect food quality by reducing its nutritional content and promoting the development of food deterioration [4]. Many synthetic antioxidants have been used in the food industries, but recent researches have mentioned the disadvantages and their possible toxic properties for human and animal health [5]. These researches have augmented the consumer awareness of the potential health benefits of naturally occurring phytochemicals from plants [6]. Therefore, much more attention is given to natural antioxidant substances for the protection of food products against the oxidizing agents [7,8]. A great number of aromatic, medicinal, spices and other plants contain chemical compounds exhibiting antioxidant properties [9,10]. Phytochemicals are a large group of plant-derived primary or secondary metabolites compounds hypothesized to be responsible for much of the disease protection conferred from diets high in fruits, vegetables, beans, cereals and plant-based beverages such as tea and wine [11]. Each class of these functional agents consists of a wide range of chemicals with differing potency [12,13]. The ever-widening choice of food ingredients makes it possible for food designers to provide food choices that meet the public's expressed desire for healthy food [14]. The most publicized bioactive phytochemicals (Fig. 1) with antioxidant properties may become the choices of additives in food for biomedical scientists and food producer. Although, there is still lacking literature regarding the comparative antioxidant potency of phytochemical and pin pointed choice for betterment of food products. Keeping all these in to account, the present study was designed to compare and evaluate *in vitro* antioxidants activities of phytochemical given in Table 1.

2. Materials and methods

2.1. Drugs and chemicals

1,1-diphenyl-2-picrylhydrazyl (DPPH), curcumin, β-carotene, gallic acid and rutin were purchased from Himedia Laboratories Pvt. Ltd., Mumbai (India). Ascorbic acid, chlorogenic acid, β-sitosterol, querecetin, stigmasterol, urosolic acid, lupeol, betulinic acid, and betaine were procured from Loba Chemie (Mumbai, India), Sigma

Abbreviations: DPPH1, 1-diphenyl-2-picrylhydrazyl; FRAP, ferric reducing antioxidant power; TPTZ, 2,4,6-tripyridyl-s-triazine.

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http://dx.doi.org/10.1016/j.bionut.2014.03.007
2210-5239/

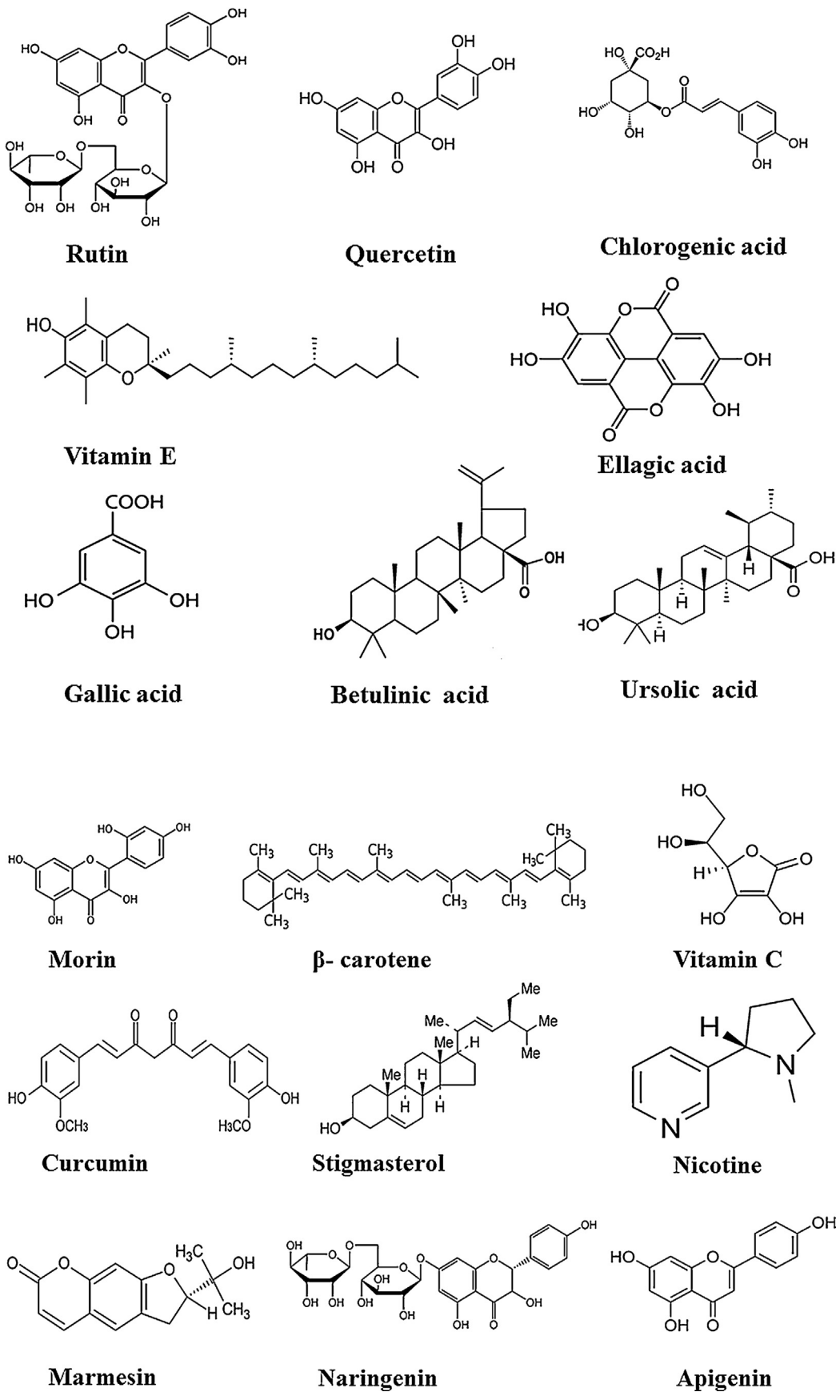

Fig. 1. Chemical structure of phytochemical used in present studies.