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Pistacia vera: chemical composition and pharmacological activities (Pistachio nuts)

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Abstract. The pistachio is a nutrient-dense nut with a heart healthy fatty-acid profile as well as protein, dietary fiber, potassium, magnesium, vitamin K, g-tocopherol, and a number of phytochemicals. This particular composition makes this dry fruit a fabulous way to prevent cardiovascular disease. The details of these pharmacological activities will be discussed in this review of the literature.

Keywords. Pistaciavera – Nuts – Antioxydative activity – Review.

***Pistacia vera* : composition chimique et activités pharmacologiques (Pistaches)**

Résumé. Les noix de pistaches sont riches en nutriments avec un profil d'acides gras insaturé ainsi que des protéines, fibres alimentaires, de potassium, de magnésium, de la vitamine K, g-tocophérol, et un certain nombre de phytoconstituants. Cette composition particulière rend ce fruit sec un fabuleux nutriment pour prévenir les maladies cardiovasculaires. Les détails de ces activités pharmacologiques seront discutés dans cette revue de la littérature.

Mots-clés. Pistaciavera – Noix – Activité antioxydante – Revue.

I – Introduction

The pistachio is a dry fruit produced by a mediterranean shrub, the real (*Pistacia vera* L.) belongs to the family Anacardiaceae. Is native of aride zones of Central and west Asia and distributed throughout the Mediterranean basin (US Department of Agriculture, 2012). For several years, special attention was given to food consumption of nuts (almonds, pistachios, etc.) because of their high content of unsaturated fatty acids and thus their beneficial effects on cardiovascular function and lipidic profile in individuals with high risk of coronary heart disease (Seeram *et al.*, 2006).

It contains about 50% of fat products, 83% composed of unsaturated acids, and about 23% of proteins and 13% of carbohydrates. It is a source of potassium, copper, magnesium and iron. Various pharmacological activities very recently have been studied in experimental works and in clinical trials to evaluate these effects on human health (F.B. Hu, W.C. Willett, 2002). Numerous studies have demonstrated beneficial effects of regular consumption of pistachios on glycaemic profile, lipid and oxidative stress parameters.

II – Materials and methods

A bibliographic investigation was carried out by analysing recognized peer-reviewed papers, consulting worldwide accepted scientific databases from the last decade (Scopus, Embase, MEDLINE/ PubMed, Springerlink and Scholar databases) using medical subject heading terms and the words: 'Pistacia vera', 'Pistacio nuts', 'anticancer', 'antiinflammatory', 'antidiabetic', 'antiproliferative', 'antioxydative', and 'cytotoxic', to identify relevant articles.

We read the titles and abstracts of all articles in an initial screen, obtaining full text unless there was clear evidence that the article would not be eligible. In the present study, interest is focused on experimental research and clinical trials.

III – Results and discussion

Tomaino *et al.* (2010) have demonstrated the excellent antioxidant activity of pistachio skins that could be explained by the high content of antioxidant compounds (Table 1). The pistachio skin could be primarily responsible for the high antioxidant activity of whole pistachio nuts. Briefly, due to their better nutritional and health profile, unpeeled pistachios should be preferred to the peeled ones in the human diet both if consumed as whole and if used in processed foods.

Table 1. Key nutrients and phytochemicals of pistachio nuts (per ounce = 28.35 g). Taken from Dreher, 2011

Nutrient	Pistachios (dry roasted/salted)
Energy (kcal)	160
Total lipid content (g)	12.7
Monounsaturated fat (g)	6.7
Polyunsaturated fat (g)	3.8
Saturated fat (g)	1.5
Protein (g)	5.9
Dietary fiber (g)	2.8
K (mg)	285
Mg (mg)	31-34
Vit K (mg)	3.7
Vit E (α -tocopherol) (mg)	0.7
Total phenols (mg)	470
γ -Tocopherol (mg)	6.7
Total phytosterols (mg)	61-82

Exploratory clinical studies suggest that pistachios help maintain healthy antioxidant and anti-inflammatory activity, glycaemic control, and endothelial function (Sari I *et al.*, 2010). When consumed in moderation, pistachios may help control body weight because of their satiety and satiation effects and their reduced net metabolizable energy content. One study with subjects in a weight-loss program demonstrated lower body mass index and triglyceride levels in individuals who consumed pistachios compared with those who consumed an isocaloric pretzel snack (Dreher M.L. 2011, Kocyigit A. *et al.*, 2006).

IV – Conclusions

The Pistachios are nutrient-dense nuts that contain a heart-healthy fatty-acid profile, protein, dietary fiber, potassium, magnesium, vitamin K, γ -tocopherol, and a number of phytochemicals, including

phytosterols, phenolic acids, and xanthophyll carotenoids. Among nuts, pistachios contain the highest levels of potassium, phytosterols, vitamin K, g-tocopherol, and lutein. A growing number of clinical studies suggest potential health benefits of pistachio nuts. Five published randomized clinical studies have shown that pistachios have a beneficial effect on blood lipid profiles. Furthermore, emerging clinical evidence suggests that pistachios may help reduce oxidative and inflammatory stress and promote vascular health, glycaemic control, appetite management, and weight control.

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