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

EL B AI RI KHAL ID, 1,2, JADDA Hajar 3, TERKMANE Chahinez 4
1: Independent research team in cancer biology and bioactive compounds – University Mohamed First – Oujda
2: Faculty of medicine and pharmacy of Oujda – Morocco (elbairi.khalid@gmail.com)
3: Laboratory of Biochemistry and Immunology, Faculty of Sciences Rabat-Morocco (jadda.hajar@gmail.com)
4: Ethnobotany laboratory and Plant Biotechnology-Abderrahmane Mira University of Bejaia(Faculty of natural sciences and life) - Department of Physico-Chemical Biology / Algeria

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, 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.

Introduction:
The pistachio is a dry fruit produced by a Mediterranean shrub, the real (Pistacia vera L.) belongs to the family Anacardiaceae. It is native to arid zones of Central and West Asia and distributed throughout the Mediterranean basin.

For several years, special attention was given to the 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 lipoprotein profile in individuals with high risk of coronary heart disease. N.P. Seeram et al 2006 and F.B. Hu et al. 2005.

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 are very recently studied in experimental works and in clinical trials to evaluate these effects on human health. Numerous studies have demonstrated beneficial effects of regular consumption of pistachios on glycemic profile, lipid and oxidative stress parameters.

The purpose of this study is to gather all available data about the pharmacological activities of pistachios.

In vitro investigations:
1. Chemical composition:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Pistachios (g)</th>
<th>Almonds (g)</th>
<th>Walnuts (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>16.5</td>
<td>10.4</td>
<td>15.8</td>
</tr>
<tr>
<td>Fat</td>
<td>33.7</td>
<td>30.2</td>
<td>26.9</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>12.5</td>
<td>41.0</td>
<td>34.0</td>
</tr>
<tr>
<td>Fiber</td>
<td>6.1</td>
<td>4.3</td>
<td>3.7</td>
</tr>
<tr>
<td>Ash</td>
<td>3.7</td>
<td>3.5</td>
<td>3.9</td>
</tr>
</tbody>
</table>

2. Antioxidative activity:
-Antonio Tomaino and coworkers have been demonstrated that the excellent antioxidant activity of pistachio skins can be explained by the high content of antioxidant compounds. 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.

Conclusion:
Pistachios are nutrient-dense nuts that contain a heart-healthy fatty-acid profile, protein, dietary fiber, potassium, magnesium, vitamin K, tocopherol, and a number of phytochemicals, including phenosterols, phenolic acids, and xanthophyll carotenoids. Among nuts, pistachios contain the highest levels of potassium, phytosterols, vitamin K, tocopherol, and lutein. A growing number of clinical studies suggest potential health benefits of pistachio nuts.

Methods:

Results and discussion:

Clinical trials:

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, glycemic control, appetite management, and weight control.

References:
5. Other references