

Honey

Subjects: **Cardiac & Cardiovascular Systems**

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Honey is one of the most prized medicinal remedies used since ancient times. There is evidence that indicates honey can function as a cardioprotective agent in cardiovascular diseases.

honey

myocardial infarction

cardiovascular disease

lipid metabolism

antioxidant

1. Introduction

Cardiovascular disease is a major public health burden worldwide. Myocardial infarction is the most common form of cardiovascular disease resulting from low blood supply to the heart. It can lead to further complications such as cardiac arrhythmia, toxic metabolite accumulation, and permanently infarcted areas. Honey protects the heart via lipid metabolism improvement, antioxidative activity, blood pressure modulation, heartbeat restoration, myocardial infarct area reduction, antiaging properties, and cell apoptosis attenuation.

2. Honey and its Constituents

Honey is a sweetener that is either consumed by itself or in combination with a variety of foods as an energy source or used for the promotion of health. It is made up of approximately 80% carbohydrate (35% glucose, 40% fructose, and 5% sucrose) and 20% water. About 180 different substances, inclusive of amino acids, vitamins, and minerals, have been reported to be contained in honey^[1].

A consensus from a comprehensive review on honey composition revealed that honey contains approximately 1.13% proteins, 0.36% minerals, 215.2 mg/g lipid, 15.5 mg/kg (hydroxymethyl)furfural, 13.2 mg/g vitamin C, 8.57 milliequivalents/kg lactone, and 873.3 mg/kg proline content. Among the major minerals that are known to be detected in honey are sodium, potassium, calcium, magnesium, lead, sulfur, and chloride^[1].

Manuka honey, the most extensively studied honey, is believed to exert its action via its bioactive constituents. Flavonoids, namely, pinobanksin, chrysin, and pinocembrin, are known to be the bioactive constituents of Manuka honey. Several proven therapeutic potentials of honey include aiding in wound healing^[2], antioxidant^[3], antimicrobial^[4], and anti-inflammatory^[5] properties. These proven therapeutic impacts of honey have been associated with its various antioxidant components that exert their effect at the molecular level of disease progression^[6].

3. Cardioprotective Effect of Honey

In terms of honey, several in vitro, in vivo, and clinical trial studies have revealed honey positively affects risk factors for heart problem by improving the plasma lipid profile^[7], suppressing oxidation^[5], attenuating elevation of cardiac damage markers (CK–MB, AST, ALT)^[8], increasing activities of antioxidant enzymes (SOD, GPx, GRx)^[9], and increasing LDL resistance to oxidation^[10] caused by oxidative stress in heart diseases. Honey is able to modulate oxidation, reduce blood pressure, restore heartbeats, reduce myocardial infarct areas, improve lipid metabolism, exert antiaging properties, and attenuate cell apoptosis. Honey is demonstrated to be a potential candidate as a natural alternative for the management of cardiovascular disease.

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