



# apple-cider-vinegar

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Cruising Review

Apple-Cider-Vinegar: Publications and Research from SwissMixIt



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Vinegar: Medicinal Uses and Antglycemic Effect

PDF Version of the webpage (first pages)

## Apple Cider Vinegar Botanical Information

### Vinegar: Medicinal Uses and Antihyperglycemic Effect

Vinegar folklore is as colorful as it is practical. Legend states that a courtier in Babylonia (c. 5000 BC) discovered wine, formed from unattended grape juice, leading to the eventual discovery of vinegar and its use as a food preservative. Hippocrates (c. 420 BC) used vinegar medicinally to manage wounds. Hannibal of Carthage (c. 200 BC), the great military leader and strategist, used vinegar to dissolve boulders that blocked his army's path. Cleopatra (c. 50 BC) dissolved precious pearls in vinegar and offered her love potion to Anthony. Sung Tse, the 10th century creator of forensic medicine, advocated hand washing with sulfur and vinegar to avoid infection during autopsies. Based on the writings of US medical practitioners dating to the late 18th century, many ailments, from dropsy to poison ivy, croup, and stomach ache, were treated with vinegar, and, before the production and marketing of hypoglycemic agents, vinegar teas were commonly consumed by diabetics to help manage their chronic ailment. Vinegar, from the French *vin aigre*, meaning sour wine, can be made from almost any fermentable carbohydrate source, including wine, molasses, dates, sorghum, apples, pears, grapes, berries, melons, coconut, honey, beer, maple syrup, potatoes, beets, malt, grains, and whey. Initially, yeasts ferment the natural food sugars to alcohol. Next, acetic acid bacteria (*Acetobacter*) convert the alcohol to acetic acid. Commercial vinegar is produced by either fast or slow fermentation processes. For the quick methods, the liquid is oxygenated by agitation and the bacteria culture is submerged permitting rapid fermentation.

Anti-obesity and anti-inflammatory effects of synthetic acetic acid vinegar and Nipa vinegar on high-fat-diet-induced obese mice Recently, food-based bioactive ingredients, such as vinegar, have been proposed as a potential solution to overcome the global obesity epidemic. Although acetic acid has been identified as the main component in vinegar that contributes to its anti-obesity effect, reports have shown that vinegar produced from different starting materials possess different degrees of bioactivity. Although both synthetic acetic acid vinegar and Nipa vinegar effectively reduced food intake and body weight, a high dose of Nipa vinegar more effectively reduced lipid deposition, improved the serum lipid profile, increased adipokine expression and suppressed inflammation in the obese mice. Thus, a high dose of Nipa vinegar may potentially alleviate obesity by altering the lipid metabolism, inflammation and gut microbe composition in high-fat-diet-induced obese mice.

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<p><b>Pineapple Vinegar Regulates Obesity-Related Genes and Alters the Gut Microbiota in High-Fat Diet (HFD) C57BL/6 Obese Mice</b> Obesity is a pandemic metabolic syndrome with increasing incidences every year. Among the significant factors that lead to obesity, overconsumption of high-fat food in daily intake is always the main contributor. Functional foods have shown a positive effect on disease prevention and provide health benefits, including counteracting obesity problem. Vinegar is one of the fermented functional beverages that have been consumed for many years, and different types of vinegar showed different bioactivities and efficacies. Collectively, these data established the mechanism of pineapple vinegar as antiobesity in mice and revealed the potential of pineapple vinegar as a functional food for obesity.</p>

<p><b>Diabetes Control: Is Vinegar a Promising Candidate to Help Achieve Targets?</b> Small significant reduction in mean HbA1c was observed after 8 to 12 weeks of vinegar administration: -0.39% (95% confidence interval = -0.59, -0.18; I 2 = 0%). Other long-term outcomes favored vinegar but were not significant. Short-term outcomes showed significantly lower pooled mean difference in glucose levels at 30 minutes in the vinegar group. Readings at 60, 90, and 120 minutes were lower in the vinegar group but not statistically significant. Adverse effects profile also favored the vinegar group.</p>

<p><b>Antimicrobial activity of apple cider vinegar against Escherichia coli, Staphylococcus aureus and Candida albicans; downregulating cytokine and microbial protein expression</b> Proteomic analyses of microbes demonstrated that ACV impaired cell integrity, organelles and protein expression. ACV treatment resulted in an absence in expression of DNA starvation protein, citrate synthase, isocitrate and malate dehydrogenases in *E. coli*; chaperone protein Dnak and *ftsZ* in *S. aureus* and pyruvate kinase, 6-phosphogluconate dehydrogenase, fructose bisphosphate were among the enzymes absent in *C. albicans* cultures. The results demonstrate ACV has multiple antimicrobial potential with clinical therapeutic implications. The Old Testament and Hippocrates reported on the use of ACV in combination with honey to combat infection and protect open skin wounds. Historically, vinegar has been produced and sold as a commercial commodity for over 5000 years. In fact up until the sixth century BC, the Babylonians were making vinegars for consumption as well as for use in healing. ACV also decreased blood triglyceride and very low density lipoprotein levels in rats which had induced cholesterol induced hepatic steatosis.</p>

<p><b>The Effect of External Apple Vinegar Application on Varicosity Symptoms, Pain, and Social Appearance Anxiety: A Randomized Controlled Trial</b> We aimed to determine the effect of external apple vinegar application on the symptoms and social appearance anxiety of varicosity patients who were suggested conservative treatment. Conclusion. We determined that the external application of apple vinegar on varicosity patients, which is a very easy application, increased the positive effects of conservative treatment.</p>

<p><b>Effect of apple cider Vinegar on blood glucose level in diabetic mice</b> Therefore, in this study it has been revealed that apple cider vinegar has considerable reducing effect on blood glucose levels in diabetic mice. The mechanism of this action and its significance remain to be elucidated in future investigations.</p>

<p><b>Apple Cider Vinegar Modulates Serum Lipid Profile, Erythrocyte, Kidney, and Liver Membrane Oxidative Stress in Ovariectomized Mice Fed High Cholesterol.</b> In conclusion, ACV induced a protective effect against erythrocyte, kidney, and liver oxidative injury, and lowered the serum lipid levels in mice fed high cholesterol, suggesting that it possesses oxidative stress scavenging effects, inhibits lipid peroxidation, and increases the levels of antioxidant enzymes and vitamin.</p>

<p><b>Phytochemicals of foods, beverages and fruit vinegars: chemistry and health effects</b> Plant-based foods and food ingredients provide a wide range of phytochemicals and antioxidants that render their beneficial health effects through a number of mechanisms. The presence of phenolics in different plant materials and beverages depends on the source material which dictates the type and quantity present. In addition, processing of raw materials, including fermentation, may alter the chemical nature and efficacy of their phenolic constituents. While vinegar has traditionally been used for food preservation and as a seasoning, more recently, fruit vinegars with different sensory characteristics have appeared in the marketplace. In addition to acetic acid, fruit vinegars often contain citric, malic, lactic, and tartaric acids and may also include phenolics, some of which are produced as a result of fermentation. The beneficial health effects of fruit vinegars may in part be related to the process-induced changes in their phenolics and generation of new antioxidative phenolics during fermentation.</p>

<p><b>Bioactive compounds and antioxidant activity analysis during orange vinegar production</b> Ascorbic acid is the major component in citrus fruits with interesting antioxidant properties, but its content in juices may vary (20-100 mg/100 mL) depending on variety or species. Despite the important role as enzymatic cofactor and antioxidant, humans cannot synthesize or store ascorbic acid in the body (Bernardi et al., 2014). Therefore, it is of great importance to provide it in the daily intake. Besides the numerous ascorbic acid benefits, loss due to heat, air and light exposure must be taken into account during processing (Passaro Carvalho and Londono-Londono, 2012; Bernardi et al., 2014). In general, antioxidant compounds and their associated AAR decreased along orange vinegar processing. As expected, total carotenoid content showed a 46% decrease during biooxidative period caused by their high susceptibility to the air contact (Damodaran et al., 2010) and particularly during this process, characterized by a constant air supply to the system. However, no concentration changes were observed during the aging stage (Vn0-Vn6). Ascorbic acid significantly decreased along orange vinegar processing. The highest reduction (49.2%) occurred during SNA acetication period probably due to continuous air flow to the system, as vitamin C is easily degraded in contact with oxygen. Orange vinegar bioactive compounds as well as their associated antioxidant activity decreased along the whole process studied, but total phenolics and carotenoids remained constant during aging period. The highest reduction was recorded during acetication stage, possibly due to component oxidation caused by continuous air flow to the system. A higher contribution to antioxidant activity was associated to ascorbic acid and phenolic compounds concentration.</p>

<p><b>STUDY ABOUT THE NUTRITIONAL AND MEDICINAL PROPERTIES OF APPLE CIDER VINEGAR ARTICLE INFO ABSTRACT</b> Apple cider vinegar otherwise known as cider vinegar or ACV, is a type of vinegar made from cider or apple must and has a pale medium color. Unpasteurized or organic ACV contains mother of vinegar. Apple cider vinegar is fermented juice from crushed apples. Like apple juice, it likely contains some pectin, vitamin B1, vitamin B2, and vitamin B6, biotin, folic acid, niacin pantothenic acid and vitamin C. Using apple cider vinegar (ACV) diabetes significantly reduces haemoglobin A1C (HbA1C), lower density lipoprotein (LDL), cholesterol and triglycerides and increase high density lipoprotein (HDL) cholesterol. In another patient model, —apple cider vinegar decreased triglycerides and very low density lipoprotein (VLDL) cholesterol. It's nutrient-rich, especially in unfiltered and organic varieties, and contains acetic acid, pectin, potassium and calcium. It also controls the blood levels, loss weight, improves cardio-vascular health, regulate body pH & detoxify body. Two spoonfuls of Apple Cider Vinegar and mix it glass of water. Take this regularly before having a meal.</p>

<p><b>Apple Cider Vinegar: Health Benefits and unwanted effects</b> Apple cider vinegar has a long history as a home remedy, used to treat everything from a sore throat to varicose veins. But there's not much science to support the claims. Still, in recent years, some researchers have been taking a closer look at apple cider vinegar and its possible benefits. It's mostly apple juice, but adding yeast turns the fruit sugar into alcohol -- this is fermentation. Bacteria turn the alcohol into acetic acid. That's what gives vinegar its sour taste and strong smell.</p>

<p><b>Effect of Apple Cider Vinegar on Glycemic Control, Hyperlipidemia and Control on Body Weight in Type 2 Diabetes Patients</b> The objective of the current review study was to investigate the effect of apple cider vinegar on glycemic control, hyperlipidemia and control on body weight in type 2 diabetes patients and other therapeutic and commercial effect of apple cider vinegar. Diabetes mellitus (DM) has been considered as one of the most universal endocrine, metabolic disorders which is characterized by the irregular metabolism of fat, protein, and carbohydrate due to decreased efficacy of insulin secretion or altered insulin activity. Curcumin is a popular spice used in all over the Asian cuisine. Curcumin known as curcuminoid found in turmeric (*Curcuma longa* Linn) has anti-inflammatory and anti-diabetes effects [16]. A study was conducted on uses of curcumin extract for prevention of the diabetes type 2, this study shows that curcumin extract delay type 2 diabetes development and improve beta cell functions, reduce insulin resistance and also reduced the numbers of pre-diabetes individual who are going to develop type 2 diabetes [17]. A double-blind placebo randomized cohort trial for 9-months show that 16.4% diabetic individual was diagnosed in placebo group significantly and none were diagnosed with type 2 diabetes in the curcumin treatment group, also better improvement in beta cell functions in the curcumin-treated group was observed as compared to the placebo group [18]. Polyphenols dietary plants and polyphenol-rich products attenuate hyperglycemia, insulin resistance, and dyslipidemia, improve adipose tissue metabolism and modulate carbohydrate, and alleviate oxidative stress. Long term diabetes complications like retinopathy, cardiovascular diseases nephropathy and neuropathy can be prevented by polyphenol compounds [19]. A single-blind randomized cross over study indicated that fiber-rich and polyphenol (PFRF) containing food have potential to effect on the glycemic index by lowering glucose absorption and also decreasing the glycemic response of polyphenol and fiber-rich food. The mechanism of PFRF inhibited alpha-amylase (strawberry, green tea, blackberry, and black currant) and activities of alpha-glycosidase (green tea) in vitro [21]. Fruits and vegetables that contain bioactive compound have been considered for the prevention of diabetes, cancer, cardiovascular diseases and is also used as an antibacterial, anti-aging and anti-inflammation agent [22]. A double-blind randomized control trial showed that cinnamon extracts water soluble for the prevention of pre-diabetes and diabetes as lowering glucose level, blood pressure, lipids and also

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