

Individual Anteaiox Phenols and Type 2 Diabetes

Curcumin

“Also, it significantly reduces fasting blood glucose, glycated hemoglobin, and body mass index. Nanocurcumin is also associated with a significant reduction in triglycerides, VLDL-c, total cholesterol, LDL-c, HDL-c, serum C reactive protein, and plasma malonaldehyde. Therefore, it can be considered in the therapeutic approach of patients with DM.” 7. [Frontiers in Endocrinology, 2021](#)

“Our findings may encourage curcumin supplementation based on its meaningful effect on glycemic control and positive trend on lipid outcomes in prediabetes and T2DM” 8. [PLOS ONE, 2019](#)

Protocatechuic Acid

“PCA restores the insulin responsiveness of OB-VAT by increasing IRS-1 and Akt phosphorylation which could be related with the lower PTP1B activity found in PCA-treated OB-VAT. Furthermore, PCA diminishes inflammation in VAT. These results support the beneficial role of an anthocyanin-rich diet against inflammation and insulin resistance in obesity.” 9. [International Journal of Obesity, 2018](#)

EGCG

“An impressive number of mechanisms and signaling pathways are proposed to explain the improved insulin sensitivity, lipid homeostasis, glucose uptake, endothelial protection and vascular performance following EGCG administration.” 10. [Molecules, 2020](#)

3,4-dihydroxyphenylacetic Acid

“ES administration could represent a promising strategy for preventing the β -cell dysfunction induced by cholesterol in vitro and possibly preventing or delaying the transition from pre-diabetes to diabetes..... In addition, given that hypercholesterolemia is associated with alterations in blood vessel differentiation and chronic cardiomyopathy, a principal cardiovascular cause of mortality linked to T2DM progression, ES could contribute to reducing the co-morbidities and mortality associated with this pathology.” 11. [Experimental Cell Research, 2015](#)

Caffeic Acid

“.....in diabetes patients, CA is a safe and potent agent that acts as an effective antioxidant in reducing serum glucose and LDL, leading to lower atherogenic indices. CA successfully regulates the hematological and biochemical abnormalities associated with diabetes that lead to weight gain, long-term diabetic control.... CA could be used as a part of healthy diet supplement to protect against diabetes and its complications.” 12. [Molecules, 2021](#)

Caffeic Acid Phenethyl Ester (CAPE)

“These results suggest that CAPE may be an important apitherapeutic agent protecting the vascular system during diabetes.....CAPE has been shown to be effective in reducing acute inflammation induced by LPS in mature adipocytes derived from human ASC (Adipose Stem Cells) [67]. LPS is known to stimulate lipolysis. Excessive lipolysis contributes to the high level of circulating fatty acids and the development of insulin resistance-associated dyslipidemia seen in metabolic syndrome [69]. CAPE restores the function of adipocytes by increasing adiponectin and PPAR γ (Peroxisome proliferator-activated receptor gamma), which leads to the reduction of pro-inflammatory factors”.

13. [Molecules, 2021](#)

Gallic Acid

“Taken together, based on the present findings, this polyphenol metabolite at low doses regulates different pathways of senescence and diabetes through its antioxidative stress potential and modulation of mitochondrial complexes activities.” 14. Molecules, 2020

Formononetin

“The present findings suggested that formononetin may potentially represent a novel candidate natural product that could be used to prevent and treat diabetic vascular complications.”

15. Molecular Medicine Reports, 2019

“It can be concluded that formononetin treatment reduces insulin resistance and attenuate hyperglycemia in type 2 diabetes which may be due to increasing expression of SIRT1 in pancreatic tissues.” 16. Frontiers in Pharmacology, 2018

Catechin

“...present data show that CTN exerts antidiabetic effects in the diabetic model via enhancing the antioxidant defense system. This study confirms the potential efficacy of CTN for diabetes management.” 17. Dose-Response: An International Journal, 2017

Cinnamic Acid

“Cinnamic acids and its derivatives have shown pleiotropic effects including stimulation of insulin secretion, improvement of pancreatic b-cell functionality, inhibition of hepatic gluconeogenesis, enhanced glucose uptake, increased insulin signaling, delay of carbohydrate digestion and glucose absorption, thus leading to marked antidiabetic activity.” 18. JHEP Reports, 2020

“Additionally, cinnamic acid stimulates glucose-induced insulin secretion in isolated islets. Taken together, these data suggest that cinnamic acid exerts anti-diabetic activity by improving insulin secretion.” 19. Phytomedicine, 2015

Kaempferol

“Kaempferol and its various glycosides have been shown to have potent antidiabetic properties together with other biological activities such as anticancer, antimicrobial, anti-inflammatory, antioxidant, and anticholesterolemic properties.”

20. Recent Patents on Anti-Infective Drug Discovery, 2016

Quercetin

“An increasing number of studies have evaluated the beneficial effects of QE on treatment of diabetes and its complications. The incidence of diabetes and its complications significantly decreases after QE intervention.” 21. Biomedicine & Pharmacotherapy, 2019

Resveratrol

“Overall, this study showed that resveratrol supplementation exerted strong antidiabetic effects in patients with type 2 diabetes.” 22. Evidence-Based Complementary and Alternative Medicine, 2013

“Data from the literature obviously show that resveratrol exerts pleiotropic action in humans..... It is concluded that resveratrol, alone or in combination with current anti-diabetic therapies, might be used in treating diabetes.” 23. Biomedicine & Pharmacotherapy, 2017

Ferulic, Ellagic and p-Coumaric Acids

“This review gives insights about the new strategies for the better management of Diabetes in the form of Combinations therapy. The combination of Ferulic acid with Metformin or THZ has shown the synergistic effect on uptake of glucose in L6myotubes and in-vivo study, the combination significantly reduced the hyperglycemia, lipid profile, and SGOT, SGPT markers.”

24. INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES, 2019

Hydroxybenzoic Acid

“Moreover, there is now full awareness that foods that are rich in phytochemicals and polyphenols could play an important role in preserving human cardiovascular health and substantial clinical evidence indicates that regular dietary consumption of such foods affects favorably carbohydrate metabolism. This review briefly summarizes the evidence relating dietary patterns rich in polyphenols with glucose metabolism and highlights the potential benefits of these compounds in the prevention of type 2 diabetes.” 25. Nutrients, 2021