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# A REVIEW ON PHYTOCHEMICAL CONSTITUENTS, ANTI-OXIDANTS AND ANTI-DIABETIC ACTIVITY OF GRAPE (VITIS VINIFERA) SEED

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**ABSTRACT:**

*Grape seed, a byproduct of the grape industry, is recognized for its high content of bioacztive polyphenols, particularly proanthocyanidins, which exhibit potent antioxidant and antidiabetic effects. These compounds have demonstrated significant potential in combating oxidative stress and managing blood glucose levels, two key factors implicated in the development and progression of diabetes mellitus. This review highlights current research on the antioxidant and antidiabetic properties of grape seed extract (GSE). Antioxidant activity in GSE is primarily attributed to its ability to scavenge free radicals, reduce oxidative stress, and prevent cellular damage. In the context of diabetes, GSE compounds are noted to improve insulin sensitivity, lower blood glucose, and inhibit carbohydrate-digesting enzymes, which together aid in controlling blood sugar levels. Both in vitro and in vivo studies indicate that GSE may help protect pancreatic beta-cells from oxidative damage, potentially preserving their function. These findings suggest that grape seed extract could serve as a promising natural supplement for the prevention and management of diabetes and related oxidative stress. However, further clinical studies are warranted to establish optimal dosages and long-term safety in human populations.*

**KEYWORDS:** *Antioxidants, Proanthocyanidins, Oxidative Stress,Antidiabetic Activity, Insulin Sensitivity, Blood Glucose Control, Free Radicals, Polyphenols.*

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