

## **A review on oxidative stress, diabetic complications, and the roles of honey polyphenols**

### **ABSTRACT**

Despite the availability of various antidiabetic drugs, diabetes mellitus (DM) remains one of the world's most prevalent chronic diseases and is a global burden. Hyperglycaemia, a characteristic of type 2 diabetes mellitus (T2DM), substantially leads to the generation of reactive oxygen species (ROS), triggering oxidative stress as well as numerous cellular and molecular modifications such as mitochondrial dysfunction affecting normal physiological functions in the body. In mitochondrial-mediated processes, oxidative pathways play an important role, although the responsible molecular mechanisms remain unclear. The impaired mitochondrial function is evidenced by insulin insensitivity in various cell types. In addition, the roles of master antioxidant pathway nuclear factor erythroid 2-related factor 2 (Nrf2)/Kelch-like ECH-associated protein 1 (Keap1)/antioxidant response elements (ARE) are being deciphered to explain various molecular pathways involved in diabetes. Dietary factors are known to influence diabetes, and many natural dietary factors have been studied to improve diabetes. Honey is primarily rich in carbohydrates and is also abundant in flavonoids and phenolic acids; thus, it is a promising therapeutic antioxidant for various disorders. Various research has indicated that honey has strong wound-healing properties and has antibacterial, anti-inflammatory, antifungal, and antiviral effects; thus, it is a promising antidiabetic agent. The potential antidiabetic mechanisms of honey were proposed based on its major constituents. This review focuses on the various prospects of using honey as an antidiabetic agent and the potential insights.