Phytochemicals of Withania somnifera as a Future Promising Drug against SARS-CoV-2: Pharmacological Role, Molecular Mechanism, Molecular Docking Evaluation, and Efficient Delivery

ABSTRACT

Coronavirus disease (COVID-19) has killed millions of people since first reported in Wuhan, China, in December 2019. Intriguingly, Withania somnifera (WS) has shown promising antiviral effects against numerous viral infections, including SARS-CoV and SARS-CoV-2, which are contributed by its phytochemicals. This review focused on the updated testing of therapeutic efficacy and associated molecular mechanisms of WS extracts and their phytochemicals against SARS-CoV-2 infection in preclinical and clinical studies with the aim to develop a long-term solution against COVID-19. Italso deciphered the current use of the in silico molecular docking approach in developing potential inhibitors from WS targeting SARS-CoV-2 and host cell receptors that may aid the development of targeted therapy against SARS-CoV-2 ranging from prior to viral entry until acute respiratory distress syndrome (ARDS). This review also discussed nanoformulations or nanocarriers in achieving effective WS delivery to enhance its bioavailability and therapeutic efficacy, consequently preventing the emergence of drug resistance, and eventually therapeutic failure.