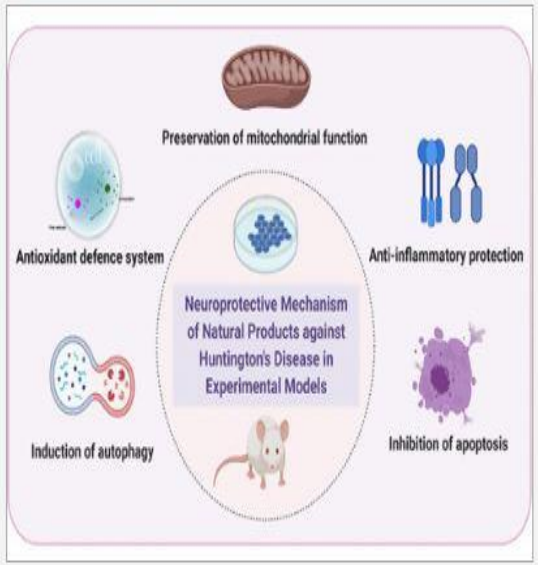
Abstract



Huntington's disease (HD), a neurodegenerative disease, normally starts in the prime of adult life, followed by a gradual occurrence of characteristic psychiatric disturbances and cognitive and motor dysfunction. To the best of our knowledge, there is no treatment available to completely mitigate the progression of HD. Among various therapeutic approaches, exhaustive literature reports have confirmed the medicinal benefits of natural products in HD experimental models. Building on this information, this review presents a brief overview of the neuroprotective mechanism(s) of natural products against *in vitro*/*in vivo* models of HD. Relevant studies were identified from several scientific databases, including PubMed, ScienceDirect, Scopus, and Google Scholar. After screening through literature from 2005 to the present, a total of 14 medicinal plant species and 30 naturally isolated compounds investigated against HD based on either *in vitro* or *in vivo* models were included in the present review. Behavioral outcomes in the HD *in vivo* model showed that natural compounds significantly attenuated 3-nitropropionic acid (3-NP) induced memory loss and motor incoordination. The biochemical alteration has been markedly alleviated with reduced lipid peroxidation, increased endogenous enzymatic antioxidants, reduced acetylcholinesterase activity, and increased mitochondrial energy production. Interestingly, following treatment with certain natural products, 3-NP-induced damage in the striatum was ameliorated, as seen histologically. Overall, natural products afforded varying degrees of neuroprotection in preclinical studies of HD via antioxidant and anti-inflammatory properties, preservation of mitochondrial function, inhibition of apoptosis, and induction of autophagy.

KEYWORDS: Huntington's disease, natural products, neuroprotective, neurodegenerative, 3-nitropropionic acid, herbal medicine