

Neuroprotective potential of *Vicia faba* seed extract in haloperidol-induced Parkinsonian rats

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Parkinsonian disorders are characterised by dopaminergic depletion and motor dysfunction, prompting growing interest in plant-derived dopamine precursors as supportive therapies. Although *Vicia faba* L. seeds are known to contain L-DOPA, evidence linking standardised extracts to functional neurobehavioral improvement, together with demonstrated central dopaminergic activity, remains limited. This study aimed to evaluate the neurobehavioral efficacy of a standardised hydro-alcoholic *V. faba* seed extract and assess its dopaminergic contribution in a haloperidol-induced Parkinsonian rat model. Extract-treated animals showed progressive improvements in paw withdrawal latency, locomotor activity, and exploratory behaviour across treatment levels compared with disease controls, with paw withdrawal time showing strong statistical significance ($p < 0.001$) and locomotor parameters also demonstrating statistically significant improvement across treatment groups. Chromatographic profiling indicated dopaminergic constituents, while brain tissue chromatographic profiles suggested the presence of centrally available levodopa-like constituents following treatment. By integrating behavioural findings with phytochemical and neurochemical evidence, this study supports the functional dopaminergic activity of *V. faba* extract beyond simple confirmation of its L-DOPA content and highlights its potential as a plant-derived adjunct for Parkinsonian symptom management. Further studies are needed to identify active constituents, clarify pharmacokinetics, and evaluate translational therapeutic relevance.

Keywords: Drug-induced parkinsonism, Levodopa, Neurobehavioral assessment, Parkinson's disease, RP-HPLC, *Vicia faba*

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