6. SCOPE FOR FURTHER WORK

A single divided dose of MPTP in the selected MPP model was a judicious approach in screening for antiParkinson’s disease owing to its systemic mode of administration and non-invasive technique unlike stereotaxic injection (where you have unilateral lesion). It showed its influence on various biomarkers except few. However, as moderate doses of MPTP showed no morphological abnormalities, chronic doses of the neurotoxin would give a still better PD model as far as histopathological examination is concerned. Since mitochondrial complex-I recover after 24 h on single dose of MPTP; repeated doses would be a rational approach.

The potential phytochemicals, viz. UA and eugenol that have shown to exhibit neuroprotective properties on sagittal brain slices can be further evaluated for additional biomarkers to provide a complete overview of its mechanistic approach. These would include D2 receptor binding assay, adenosine A2 receptor antagonistic activity and TH immunohistochemistry.

Dopaminergic D2 receptor binding assay as in homogenized striatum with the adenosine receptor A2AR binding activity determination by radioassay methods would be quite significant in investigating its role in modulation of neurotransmitters and/or their effects on relevant receptors.

Tyrosine hydroxylase (TH) is an enzyme that plays a role in converting the amino acid L-tyrosine into L-DOPA, which in turn is converted into DA. Tyrosine Hydroxylase (TH) levels estimation can be done using immunohistochemical studies

\[
\text{L-tyrosine} + \text{THFA} + \text{O}_2 + \text{Fe}^{2+} \xrightarrow{\text{TH}} \text{L-dopa} + \text{DHFA} + \text{H}_2\text{O} + \text{Fe}^{3+}
\]

where THFA is tetrahydrofolic acid

Thus, D2 receptor agonism and/or A2AR receptor antagonism with overexpression of TH can be of potential use in screening of neuroprotective agents in the treatment of PD.