

**Notification: Ph.D./notification/512/2022**  
**Date of Award:13-09-2022**

**Name of Scholar: Rahat Ali**

**Name of Supervisor: Dr. Abdur Rub**

**Name of Department: Department of Biotechnology, Jamia Millia Islamia**

## **Title: Study of antileishmanial activity of medicinal plants and natural compounds**

We selected four medicinal plants namely *Emblica officinalis* (E. officinalis), *Acacia nilotica* (A. nilotica) *Achyranthus aspera* (A. aspera) *Ficus reliogisa* (F. reliogisa) and three natural compounds sesamol, caprylic acid sinenstin for evaluation of their antileishmanial potential. We prepared the extract of selected plants in methanolic solvents and screened them for their antileishmanial potential. The preliminary investigations showed that among three compounds, only sesamol showed promising leishmanicidal activity though caprylic acid and sinestein did not show any significant inhibitory effect on growth and proliferation of parasites. IC<sub>50</sub> value of the sesamol was determined as 25.19±1.44 μM on promastigote after 48 h. Sesamol reduced intracellular parasite load significantly in infected macrophages. Cytotoxic assay of sesamol showed its high Selectivity Index value to be further considered in process of drug-discovery against leishmaniasis. Sesamol induced apoptosis-like cell death in *L. donovani* parasites mediated through oxidative stress. Sesamol induce mitochondrial dysfunction, which further caused excessive elevation of ROS to cytotoxic level inside the cell which facilitated the death of parasites. These findings suggested the possible use of E. officilanis, A. nilotica extracts as well as sesamol as potential antileishmanial candidates having low cost, higher efficacy with least cytotoxicity for further clinical testing after *in vivo* validations.



