WORK PLAN AND METHODOLOGY:

1. Extensive literature study about the research topic-
   a. Literature will be reviewed in detail from traditional texts, reference books, journals and electronic database etc.

2. Procurement and standardization of herbal drugs-
   a. Crude drug will be procured and standardization of crude drug will be carried out by WHO guidelines

3. Design the extraction of plant materials-
   a. Different extracts will be prepared using different polarity solvents using soxhlation method.

4. Acute, subacute toxicity study of the extracts-
   a. Extracts will be subjected for preclinical study to find out LD50 value following OECD guidelines

5. Dose fixation study for hepatoprotective activity-
   a. Preliminary animal model will be carried out with every extract to choose minimum effective dose for the further study.

6. Fractionation of extract for desired chemical constituent/activity guided fractionation-
   a. Based on the activity shown by the extracts in the preliminary animal model, the extract providing best activity will be chosen for further fractionation.
   b. Fractionation of the extract will be carried out by using solvents of different polarity by referring the already reported literature.

7. Analysis and standardize the lead fraction of the active extract-
   a. Fraction will be analysed and standardized with HPTLC studies

8. Preclinical investigation of different fractions for the said activity with the help of various animal models-
   Several animal models will be carried out to investigate probable hepatoprotective activity-
   1. CCl₄ induced toxicity in rats
   2. Alcohol induced toxicity in rats
   3. Paracetamol induced toxicity in rats
   4. In vivo antioxidant studies
5. Detailed histopathological investigation of rat liver upon treatment of different fractions

9. Isolation of the probable chemical constituent responsible for the activity-
   a. The fraction producing highest activity will be chosen from the preclinical experimentation--
   b. The chosen fraction will be subjected for isolation of chemical constituent using column chromatography

10. Isolation of the probable active principle from the fraction-
    a. The active fraction subjected to column will be run using different polarity gradient for getting single compound

11. Interpretation of the isolated compound-
    a. Isolated compound will be elucidated with sophisticated techniques such as NMR, IR and UV.

12. Finding out the probable mechanism of action for the activity-
    a. Dose and probable mechanism of action of the isolated compound will be checked with animal experimentation

13. Suggestion of the future scope of the research topic