3. PLAN OF WORK

The work was planned to cover following aspects:

i. **Procurement** of raw material of different species/varieties of *Barleria* viz., *B. prionitis* Linn. *B. cristata* Linn. var. *dichotoma* (White flower variety), *B. cristata* Linn. (Blue flower variety), *B. cristata* Linn. (Pink flower variety) and *B. lupulina* Lindl. and their authentication.

ii. **Preparation of extracts** of different *Barleria* species using cold maceration and partition technique.

iii. **Chemical/Qualitative studies**

   - **Phytochemical screening:** It will be done on various extracts of *Barleria* species following well known methods.
   
   - **TLC fingerprint profile:** Development of TLC profiles of different plant parts and extracts of five different species of *Barleria* viz., *B. prionitis* Linn. *B. cristata* Linn. var. *dichotoma* (White flower variety), *B. cristata* Linn. (Blue flower variety), *B. cristata* Linn. (Pink flower variety) and *B. lupulina* Lindl. for quick comparison of the *Barleria* species.

iv. **Phytochemical studies:** Depending upon the availability of plant material and presence of iridoids in different species of *Barleria*, a suitable specie/variety will be selected and phytochemical study will be carried out for the isolation of targeted iridoid markers.

v. **Analytical studies:** The quantitative estimation of the isolated markers in different plant parts and different extracts of the selected *Barleria* species/varieties will be estimated using three different techniques viz., HPTLC, HPLC and UPLC.

vi. **Biological studies:**

   - **Toxicity studies:** Acute toxicity will be carried as per OECD 425 guidelines (Up and Down Procedure).
On the basis of chemical profile of different *Barleria* species, the iridoids containing species will be taken up further for various biological activities viz., anti-inflammatory, analgesic, antiulcer and antiarthritic. Also, the *in vivo* assessment of different activities will be carried out on the isolated markers.

**Anti-inflammatory activity of crude extracts and pure compounds**

**Acute studies:** It will be done in different models viz., carrageenan induced rat paw oedema model, histamine induced rat paw oedema model and dextran induced rat paw oedema model and using different standards like ibuprofen, dexamethasone, celecoxib and nimesulide.

**Sub-acute studies:** Cotton pellet induced granuloma model will be used for this study.

**Topical studies:** Croton oil induced ear oedema model will be used to study topical anti-inflammatory effect.

**Analgesic activity**

**Central model:** Tail flick model will be used to know the pain relieving potential of *Barleria/pure* compounds.

**Peripheral model:** Acetic acid induced writhing model will be followed to know the analgesic potential of *Barleria/pure* compounds.

**Antiulcer activity**

Pyloric ligation induced ulcer model will be taken up to assess the gastric protection ability of the selected species of genus *Barleria/pure* compounds.

**Antiarthritic activity**

This study will be done using Complete Freud’s Adjuvant induced arthritis in rats.

Based on the findings of biological evaluation, an attempt will be made to propose the possible mechanism of action of the selected *Barleria/Iridoid* markers as anti-inflammatory, analgesic, antiulcer and antiarthritic agents.
Plate 1: *B. prionitis* Linn. (Whole plant)

Plate 2: *B. cristata* Linn. var. *dichotoma* (Whole plant)
Plate 3: *B. cristata* Linn. (Pink flower variety, Whole)

Plate 4: *B. cristata* Linn. (Blue flower variety, Whole)
Plate 5: *B. lupulina* Lindl. (Whole pl