3. Rationale

3.1 Rationale of work
Ayurveda is one of the progressive streams of medicine in country with a strong clinical base. The plants used in Ayurveda have diversified uses. Ayurveda is a great science and philosophy. To put this on world map, isolation of marker compounds from plants has become very essential. Nationally and internationally ample of work is being done on natural product chemistry but availability of marker compounds is freely available. It becomes important to develop a commercially viable, robust method for isolation of marker compounds from Ayurvedic plants for the validation of formulation as well as the plant itself. With the advent of modern technology, it is possible to isolate, characterize and validate the marker compounds which can prove the authenticity of Ayurvedic formulations.

Fortunately, the interest to discover novel compounds from natural origin is on the rise. Some global pharmaceutical companies have already engaged themselves in intense and systematic research so as to develop new medicines from nature. Amla and Mamejeva are amongst the widely used plants for making many ayurvediac formulations. There is a need to develop specific marker compounds and method of standardization for identifying phytoconstituents from this plant. The project is envisaged with this objective.

3.2 Objectives of work

- Isolation of phytoconstituents from the *Enicostemma littorale* and *Phyllanthus emblica*.
- Development of new commercially viable isolation and purification methods.
- Method development and validation of isolated marker compound by HPLC, HPTLC and LC-MS/MS method.
- Safety and Antidiabetic study of *Enicostemma littorale* and *Phyllanthus emblica*. 

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3.3 Plan of work

1. **Collection and authentication** of plant materials.

2. **Standardization** of fruits of *Phyllanthus emblica*, whole plant of *Enicostemma littorale*: To study different physicochemical parameters and to carry out macroscopic and microscopic studies as per standard pharmacopoeial procedures.

3. **Extraction, fractionation and phytochemical screening** of plant material with various organic solvents of increasing polarity.

4. **TLC and HPTLC fingerprinting** of different extract of plants *Phyllanthus emblica* and *Enicostemma littorale*.

5. **Isolation and Purification of marker compounds** and development of new commercially viable isolation and purification methods.

6. **Characterization and structural elucidation** of isolated marker compounds by different spectroscopic methods: NMR, Mass, LC-MS/MS etc.

7. **HPLC/ HPTLC method development** for validation of the isolated marker compounds.

8. **HPLC-LC/MS/MS analysis** for the identification of phytoconstituents present in the extracts of plant *Phyllanthus emblica* and *Enicostemma littorale*.

9. **Safety studies**: To study acute and repeated dose toxicity profile of ethyl acetate extract of *Enicostemma littorale* and *Phyllanthus emblica*.

10. **Antidiabetic activity**: To study antidiabetic activity of *Enicostemma littorale* and *Phyllanthus emblica* in Streptozotocin induced diabetic rats.