CHAPTER 3

RATIONALE OF THE STUDY AND OBJECTIVES

3.1 Rationale of the study

At present, the pharmaceutical prescription market to treat GI disorders is valued at just over $20 billion, reflecting that it is one of the largest and most important therapeutic areas. 5 - 15% of the adult population of the world are suffering with peptic ulcer disease [22]. India has 5th rank in peptic ulcer disease with a death rate of 12.37/Lakh population. Though peptic ulcer of the stomach and duodenum was known in the 1700s but there is revolution of understanding and management of PUD after the discovery of Helicobacter pylori. Based on the type of mechanism of action, a number of treatments are available for peptic ulcer. For example, use of antacids, H2 blockers, proton pump inhibitors, antibiotic, and combination therapy. But each category is having unavoidable limitations, for example, high doses and long term use of H2 blockers and proton pump inhibitors (PPIs) cause hip fracture, [93] carry a possible increased risk of bone fractures [89]. Although PPIs are well-tolerated, but there have been reports for acute interstitial nephritis (AIN) and progression to acute renal failure (ARF) [91] due to long term use of PPIs. The other alarming side effects of PPIs are osteoporosis, hepatitis, visual disturbance [91] which cannot be overlooked. FDA approved double, triple & quadruple therapies are not also resulting 100% eradication of H. pylori which causes treatment failure. The main reason of treatment failure is patient noncompliance due to concomitant use of medicine. Patients have to follow the combination therapy, as PUD is a multifactorial disease and each category of medicine is having a different mechanism of action. Hence a single drug treatment fails to meet the need. For the cheaper option if any, category is removed from combination therapy, it leads to reduction in efficacy. Development of antibiotic resistance is one of the most challenging issues in the management of PUD. In this aspect, herbal approach would be a better option as it might act through multiple mechanisms of action.

Paederia foetida L. (Rubiaceae) is an extensive foetid climber found in the Himalayas up to an altitude of 1800 m [198]. There are many scientific and traditional claims to the benefits
of *P. foetida* especially concern to the gastrointestinal tract (GIT) disorders such as anti diarrhoeal, loose motion, clean stomach, against stomach swelling, piles, abdominal pain, carminative, spasms, in gastralgia, flatulence or other gastric trouble like gastritis and ulcer [199,172,180,181,185,192]. It has been observed that from Northeast to South part of India, different community of tribal people uses this plant as vegetables and also in different ailment which is seems to be peptic ulcer and also in other gastric trouble [176,177,183,186,197]. In spite of the miles of distance, the common use of the plant by different community of people concrete the hypothesis that the plant must contain some potent anti ulcer agent which need to be evaluated, standardize and commercialize.

There are several research reports which support that concomitant use of NSAIDs in case of arthritic patients increase the risk of gastric ulcer 3 to 4 fold [70,71] which is becoming a crucial issue for the recurrence of ulceration. It is anticipated that a standardized extract of *Paederia foetida* L. not only beneficial for the ulcer patient, but also could effective for arthritic patients too as clinical study reveals that *P. foetida* extract is potent against the rheumatoid arthritis [2001. So it seems to be saying kill two birds with one stone. Rheu capsule for arthritic patient manufacture by Ban Lab, Mumbai contain *P. foetida* as one of the ingredients.

There is no systemic study has been done in the area of standardization of the plant extract with respect to markers. We hypothesize that standardization and evaluation of *P. foetida* not only having a unique benefit to medicinal prevention, but also it sheds light on the nutritional importance and value of the wild products used as food and medicine. Evaluation and analysis of tribal plant offer a new platform for development of new drug and can serve as a key role in the safety and cost effective.

### 3.2 Objectives

The current study has the following objectives:-

3.2.1 Field study to assess the richness of ethno botanical plant species used by the tribes of north east Tripura
3.2.2 Phytochemical analysis and standardization of *P. foetida* extract

3.2.2.1 Qualitative phytochemical analysis

3.2.2.2 GC-MS analysis of volatile constituents of *P. foetida*

3.2.2.3 Standardization of *P. foetida* extract

3.2.3 Evaluation of anti ulcer activity (*in vivo & in vitro*) of *P. foetida* extract

3.2.3.1 Evaluation of *in-vitro* antioxidant activity

3.2.3.2 Assessment of *in-vitro* anti *Helicobacter pylori* activity

3.2.3.3 Evaluation of *in vitro* anti ulcer activity

3.2.3.4 Western blot analysis