Inflammation is one of the leading causes of death and morbidity in the world. Drugs which are presently used for the management of pain and inflammatory conditions are either non-narcotics like NSAIDs or narcotics like opioids. These drugs are very expensive to develop and the successful introduction of any new synthetic drug costs million of dollars. Moreover these drugs present well known side-effects. On the contrary, medicines of plant origin have been used since ancient time to treat inflammation without any adverse effects. Plants represent a large untapped source of structurally novel compounds that may serve as lead for the development of novel drugs. It is therefore essential that efforts should be made to introduce new medicinal plants to develop cost-effective anti-inflammatory drugs.

With this in mind, *Bacopa monniera* (Brahmi) was selected for investigation of anti-inflammatory activity. The investigations on the anti-inflammatory and anti-arthritic effects of *Bacopa monniera* and the identification of an active constituent in *Bacopa monniera* which mediates this effect forms the subject matter of this thesis.

A brief review of the literature on the pathobiochemistry of inflammation and the role of anti-inflammatory drugs is given in the introductory chapter. The materials and methods employed for investigating the anti-inflammatory effect of *Bacopa monniera* is given in chapter 2. Chapter 3 investigates the anti-inflammatory activity of different extracts of *Bacopa monniera*. Chapter 4 investigates the anti-arthritic effect of Bacopa extract using experimentally induced arthritic model systems. Chapter 5 examines the anti-inflammatory / anti-arthritic effect of a purified fraction of Bacopa using *in vivo* and *in vitro* techniques. The isolation of anti-inflammatory principle and its identification is also detailed in this chapter. The mechanism of anti-inflammatory effect of the isolated compound is investigated and the results are presented in chapter 6. A summary of the results of these investigations is given in chapter 7.