

## Preface

Haemorrhoids are a very common anorectal pathological condition defined as the symptomatic enlargement and distal displacement of the normal anal cushions. The symptoms include rectal bleeding associated with bowel movement, perianal itching, anal discomfort & pain, anal discharge, swelling, anaemia. The pathological haemorrhoids are generally diagnosed by observing abnormal dilatation and distortion of the vascular channel, destructive changes in the supporting connective tissue within the anal cushion. The associated pathophysiology is not clear for the development of haemorrhoids as pathological disease but several inflammatory markers and vasoactive mediators are found to be associated in disease development. As per the reports, one in five individuals suffers from this disease once in its lifetime globally. The overall prevalence rate of haemorrhoids in India is 75% whereas 4.4% has been reported worldwide. The current management strategies adopted for the treatment include surgical and non-surgical procedures which are tedious with high relapse rate. The medications available, provide only symptomatic treatment with no clear clinical evidence. Since, haemorrhoids is most frequent anorectal disorder affecting people's quality of life and the current management strategies are not sufficient to provide complete relief to the patient, there is a need to develop new drug molecules for its cure.

*Blumea lacera* (Burm. f.) DC. belonging to family Asteraceae is an annual herb with a strong odour. Traditionally, it is used internally and externally as an anti-inflammatory agent. The juice of leaves along with black pepper (*Piper nigrum*) is given to cure bleeding piles. This herb is also offered as anthelmintic (especially for threadworm). Leaves and roots are used as astringent, diuretic and febrifuge and even in cuts and wounds.

Considering the disease complexity, challenges in current management strategies, and in search for better alternative from natural origin the ethnomedicinal claim of the plant *Blumea lacera* (Burm. f.) DC. as anti-haemorrhoid agent was validated with further development of silver nanoparticles using this plant. Furthermore, the anti-haemorrhoid potential of the developed silver nanoparticles was also evaluated using croton oil induced haemorrhoids in rat model.

The present study is divided into seven chapters:

**Chapter 1** deals with the brief introduction of haemorrhoids, its types, and role of herbal drugs in the treatment of haemorrhoids.

**Chapter 2** provides insight into the literature reports related to pathophysiology, current treatment strategies for the treatment of haemorrhoids and provides detailed information about the plant *Blumea lacera* (Burm. f.) DC.

**Chapter 3** includes the objectives and plan of work.

**Chapter 4** deals with the evaluation of ethanolic extract of *Blumea lacera* (Burm. f.) DC plant for its anti-haemorrhoid potential.

**Chapter 5** deals with *in vitro*, *in silico* studies of the fractions prepared through successive solvent fractionation using standardized extract and development of silver nanoparticles.

**Chapter 6** deals with the evaluation anti-haemorrhoid potential of the developed silver nanoparticles using croton oil induced haemorrhoids in rat model.

**Chapter 7** deals with the conclusion and summary.

References used to carry out the research work, are presented and a list of publications during the Ph.D. are included.