CHAPTER 8

SUMMARY AND CONCLUSION

Whole plant of Lobelia trigona Roxb was taken for evaluating antimicrobial, antioxidant and wound healing efficacy by extracting the active principle. It was observed that ethanolic solvent extract of Lobelia trigona Roxb showed the presence of almost all the phytochemicals analyzed.

Lobelia trigona Roxb ethanolic extract estimated for phenolic, flavonoid, tannin, terpenoid, alkaloid and saponin content. Lobelia trigona Roxb ethanolic extract had rich polyphenol and terpenoid contents followed by tannin, flavonoid, alkaloid and saponin contents.

Major tentative compounds of Lobelia trigona Roxb ethanolic extract are Quinuclidine, Massoia lactone, Sclareolide, Canrenone, Tritriacontane. All of these compounds possess antimicrobial activity whereas Sclareolide and Massoia lactone possess anti-oxidant activity and Canrenone possesses anti-fibrogenic and wound healing activity.

Lobelia trigona Roxb ethanolic extract had good anti-microbial (anti-bacterial and anti-fungal) activity against all the test microorganisms especially against methicillin resistant Staphylococcus aureus and Acenetobacter baumannii. Lobelia trigona Roxb ethanolic extract had strong antioxidant activity.

The effect of Lobelia trigona Roxb ethanolic extract on the migration of HaCaT keratinocyte cells was investigated and observed a dose-dependent
stimulation of migration. The cell migration was found maximum with 100 µg/mL of *Lobelia trigona* Roxb ethanolic extract. The *Lobelia trigona* Roxb ethanolic extract exhibited the most promising effects of wound healing *in vitro*.

The *in vivo* wound contraction potential of *Lobelia trigona* Roxb ointment on an excision wound and burn wound was significantly much greater than that of the reference standard that contains 1% w/w Silver Sulphadiazine.

It can be concluded that topical ointment of 10 % w/w *Lobelia trigona* Roxb ethanolic extract significantly increased the fibroblast growth which plays a major role in collagen synthesis and in anatomic integrity of excision and burn wound healing. 10% w/w *Lobelia trigona* Roxb ethanolic extract possesses good tensile strength.

Biochemical evaluation revealed that *Lobelia trigona* Roxb ethanolic extract has helped in its proper deposition and alignment of collagen. In *Lobelia trigona* Roxb treated wounds, the levels of uronic acid and hexosamine gradually increased from day 4 until day 8 post wounding and gradually decreased thereafter.

The wound healing action of *Lobelia trigona* Roxb might have occurred because of the rich content of wound healing phytochemical components (tannin, terpenoid, phenolic and flavonoid content) present in it. The chemical constituents of *Lobelia trigona* Roxb includes polyphenols, flavonoids, alkaloids, steroids, saponins, tannins, glycosides, terpenoids, reducing sugars, pholabatannins, carbohydrates, lactones, resins, cardenolides, vitamin C, proteins and amino acids (Rex et al. 2015). All of the above mentioned phytochemical constituents play a major role in wound healing and also in improving and maintaining human health (Trevisanato 2000).
As the results show that groups treated with 10 % w/w *Lobelia trigona* Roxb ethanolic extract healed faster, showed less scar, less inflammation and more fibroblasts and collagen, we propose that the ointment of *Lobelia trigona* Roxb ethanolic extract might have enhanced the excision and burn wound healing time and process by increasing the rate of all the wound healing phases, such as cell proliferation and collagen formation.

The outcome of this research work concluded that *Lobelia trigona* Roxb ethanolic extract contains various bioactive compounds which have antioxidant potential and controlling microbial infection thereby, enhancing wound healing.

This is the first attempt to report on *Lobelia trigona* Roxb and my data, enlightened and gave an authentication for the regular use of *Lobelia trigona* Roxb for healing wounds and other skin diseases. It also gives a hope that these results can enable the plant extract for the treatment of wounds infected with highly drug resistant bacteria.

Nevertheless, it is not known whether the activity was due to a single compound or to a complex of compounds and/or compounds interactions. Phytochemical compounds identified in the ethanolic extract of *Lobelia trigona* Roxb are reported to have good anti-microbial, anti-oxidant and also have wound healing activities. Therefore, it may be concluded that *Lobelia trigona* Roxb is a highly valuable medicinal plant having different compounds with anti-microbial, anti-oxidant and wound healing properties.