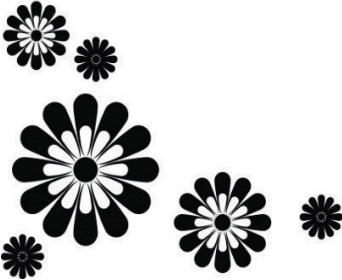


CHAPTER 7
SUMMARY AND
CONCLUSION



In chapter 5, we summarized Pharmacognostic characteristics of selected herbs reveals their nature and their powder characteristics showed presence of lignified tissues, starch, aleurone grains etc. Phytochemical investigation of selected herbs by HPTLC method indicated presence of Polyphenol flavonoids like Quercetin and Luteolin, Triterpenoids like Ursolic acid, Lupeol and Oleanolic acid, Phenolic acid like Gallic acid, Fixed oil like Oleic acid etc. in aqueous extract of *Boerhavia diffusa*, *Plumeria rubra* and *Celosia argentea* contributing for its effect Antilithiatic activity against Ethylene glycol induced urolithiasis.

Two combinations of *B. diffusa*, *P. rubra* pods and *C. argentea* seeds were prepared containing 2:1:1 and 4:1:1 ratios out of these two combinations 4:1:1 was proved more effective through invitro and in vivo study. Preliminary study of plant extracts on kidney stone shows each plant has stone dissolution potential recommending their further in vitro and in vivo study of the plant extracts.

The in vivo study utilized two concentrations (200 mg/kg and 400 mg/kg) for the experimental groups. Ethylene glycol served as the stone-forming agent, and the study spanned 28 days with urine collection every 24 hours using metabolic cages. Urine analysis from the disease control animals indicated a significant increase in calcium, phosphorus, and oxalate excretion compared to group I animals, alongside a decrease in magnesium levels. Treatment with the plant extract notably reduced the elevated levels of calcium, phosphorus, and oxalate compared to group II animals, and restored magnesium levels comparable to those in normal animals.

Serum analysis involved blood collection from the retro-orbital plexus. It revealed that treatment with Extracts 1 and 2 (at 200 mg/kg and 400 mg/kg doses) and cystone (750 mg/kg) significantly increased serum calcium, serum phosphorus, blood urea nitrogen (BUN), serum creatinine, and serum uric acid levels compared to DC rats ($p < 0.05$; $p < 0.01$; $p < 0.001$). The polyherbal extract at 400 mg/kg from all three plants showed effectiveness in treating kidney stones. The exact mechanism underlying the antiurolithiatic activity of extracts from *B. diffusa*, *P. rubra* seed pods, and *C. argentea* seeds remains unexplained in the present study, though several potential mechanisms are proposed to account for their antilithiatic and prophylactic effects.

- Diuretic potential- *B. diffusa* and *P. rubra* seed pods are seen as potent diuretic, while *C. argentea* was mild diuretic, also various researcher studied and proved this property

in their studies. Kidney stone is generally associated with less urination. Many times hydrotherapy is employed by giving normal saline solution by IV route, as it dilutes the concentration of stone forming agents in urinary system. Diuretics accelerate the dissolution of preformed stone also can avoid reformation of stone. Therefore diuretic property of extract of these herbal drugs may avoid supersaturation and thereby formation and reoccurrence of kidney stone.

- Antimicrobial activity- Any kidney disease like kidney stone, Urinary tract infection, anuria is associated with presence of microbial infection characterised by burning urination, itching, etc. Seed pod of *P. rubra* consists of antimicrobial property as many researched revealed the same through their studies. Antimicrobial assay proved the presence of antimicrobial property of *P. rubra* as plants containing latex shows antimicrobial potential and can be applied on open wound This can be beneficial in treating patient with such symptoms.
- Herbs used in present study were chosen from the history of their use for the treatment of kidney stone on the basis of their folklore value and used by local peoples. Some of the people showed very instantaneous result in dislodging of stone and non-reoccurrence of the stone has been reported. This study advocated the same by ascertaining the stone dissolution study by invitromodel and in vivo study of urine microscopy also revealed the stone dissolution potential of extract of drug combination as compared to normal and diseased control group.
- Conclusion drawn from this research activity is that, aqueous and methanolic extract of *B. diffusa*, *P. rubra* seed pod, *C. argentea* seeds if used in human in appropriate doses (on the basis of animal doses in the present study) might be very beneficial to dissolve and expel the kidney stones. Also may be prove beneficial to avoid reoccurrence of stone either by changing levels of parathyroid hormone and calcitonin or by avoiding nucleation process by facilitating increased excretion of magnesium, a potent inhibitor of stone formation and decreased excretion of stone forming constituents like calcium, oxalate and phosphoro This study is to flash light on such herbs available near us but as we don't know the exact activity and combinations of such herbs in appropriate concentration. Many time we focus on main species of plants but we don't know that allied species are also equally or more important. Also,

appropriate concentration of such herbs should be known for their effective and efficacious use.

Further research is recommended to identify the pharmacologically active phytoconstituents responsible for the antilithiatic activity observed in selected herbs. It is essential to evaluate these constituents' benefits in treating kidney stones through clinical research to confirm their efficacy in humans. Many plants produce seed pods or seeds that are only available during specific seasons. The current study also explores pharmaceutical dosage forms containing extracts from these plant seeds or seed pods, ensuring availability year-round for the treatment of kidney stones as needed.

So, finally, as the results are obliged for the use of three plant extract in suitable dosage form, we close the study with high delight and we excavate the avenue for transferring benefits to researcher as well as patients suffering from kidney stone.

FUTURE SCOPE

The present investigations future scope may be aimed at:

1. The present investigation recommends exhaustive work on various other novel drug delivery system dosage forms.
 - The present investigation needs determination pharmacokinetic parameters on human volunteer, aiming towards availability of one of the effective formulation in the market, to treat needy patients with less side effect due to use of polyherbal ingredients.