CHAPTER- 1

INTRODUCTION
The kidney is one of the most vital organs in the body. According to current knowledge, it has a very fascinating structure and a highly specialized physiological capability. It suffers from specialized types of diseases which have a trend to bring about irreversible changes. And generally, it is believed that the human kidneys do not regenerate. Thus, the kidney being a highly specialized organ with vital functions and having a trend to undergo irreversible changes in its common disorders, need specialized care in the management. The current therapy in kidney pathology is mostly palliative, and there is minimal scope for specified curative treatment. The recent attempts in the management of renal failure like dialytic measures and renal transplantation have although proved life saving procedures in certain cases, they are applicable only in a selected class of sufferers. Therefore, the management of kidney diseases and renal failure is an open challenge for today's medical profession.
Generally inflammatory diseases of the kidney gradually lead to degeneration of the kidney cells and supporting structures with progressive fibrosis. This particular event is more rapid and effective in severely inflammed organs. Therefore, possibly the application of anti-inflammatory measures combined with agents stimulating regeneration of the kidney cells would be a beneficial approach in the revival of kidney in the inflammatory diseases which form the major part of kidney disorders. Thus there is a need of search for a suitable and effective drug for treatment of kidney diseases which may promote regenerative changes.

Generally testing of a new drug involves several fundamental aspects of which the important ones are biological assays, biological standardization procedures, study of individual variation in drug response, dose response relation, therapeutic index, assessment of drug toxicity and other adverse effects, determination of dosage and clinical trials. It should be emphasized here that all these procedures involve difficult, elaborate, time consuming techniques and are fairly expensive investigations and thus require long term planned team work.

The actual pharmaceutical development of a new drug also requires a number of standardization procedures before the drug
comes for routine use in patients. As rightly emphasized by Banerjee (1969), the discovery of a chemical compound with a specific therapeutic affect is preceded by a screening procedure lasting several years and involving thousands of tests. At this stage the compound is patented by the pharmaceutical firm after giving a general name to abbreviate the actual chemical description. After this the dealing firm works for the Brand Name of the compound which is actually the guarantee of perfection from the firm concerned. This involves a series of investigations called formulation research. The essential aspects of formulation research are to suitably determine stability, purity, particulate size and absorption, vehicle or base, compatibility, sustained release medication, disintegration, solubility, enteric coating, quantity of active ingredient, pH, isotonicity, surface tension, viscosity, ease of application and removal, caloric value, melting point, flavour, purity and sterility, peaking procedures, storage, control number, quality control etc. Thus the evaluation and development of a new drug is in itself an independent discipline and requires the skill of a pharmacologist, pharmacist and many clinicians.

The knowledge of medicinal plants must have been accumulated in the course of many countries. It is greatly to the credit of the people of India that they were acquainted with a few
larger number of medicinal plants than the natives of any other country.

In India, the references to the curative properties of some herbs in the Rigveda seem to be the earliest record of use of plants in medicine. The identity of several plants referred in the Suktas of the Rigveda can be fixed with reasonable certainty, e.g. of Semal, Pithwan, Palash and Pipal, but references to plants in the Rigveda are very brief. More detailed account is available in the Atharava Veda. The period of Rigveda is estimated to be between 3500 and 1800 B. C. After the Vedas, there is no information in the development of this science in India for a period of about 1000 years. Then two most important works on Indian System of medicine have come, the work of charak and Susruta namely the Charak-Samhita and Susruta-Samhita. Susruta-Samhita deals with about 700 drugs, some of this were not indigenous to India. With the passing of time, more and more plants found entry into native medicine, taking the number of Indian medicinal herbs to about 1500 (Jain, 1968). The great range of temperature (about 43°C to 49°C), rainfall (from 100 mm. to over 10,000 mm.) and attitude (Sea-level to over 6000 m.) in India account for the occurrence of some 20,000 different species of higher plants in India.
The Indian indigenous drug Punarnava used (*Boerhaavia diffusa* Linn.) has long been used in traditional medicine system as a diuretic (to improve urination) for many types of kidney and Urinary disorders.

There are a number of physically similar plants known in the fields as PUNARNAVA and similarly a number of different plants are sold in different markets in the name of PUNARNAVA.

The market and field surveys conducted, revealed four different plants which are known and are used as PUNARNAVA. These plants were finally identified as: (1) *Boerhaavia diffusa* Linn., red flowered variety; (2) *Boerhaavia diffusa* Linn., white flowered variety; (3) *Trianthema monogyna* Linn. with red flowers and (4) *Trianthema monogyna* Linn. with white flowers. Red flowered *Boerhaavia diffusa* was abundantly seen throughout the year in waste fields and along the roads and showed very wide variation in the physical characters depending upon the soil and season, while *Trianthema monogyna* with both red and white flowers was more profusely seen after rains and was very much less in other seasons. The white flowered *Boerhaavia diffusa* was rare and was available only in the medicinal garden area. It was more distinctly robust plant than the common red flowered variety of *Boerhaavia diffusa*, *Boerhaavia diffusa* was identified as 'PUNARNAVA' and 'Trianthema monogyna' as
'VARSHABHU' of Ayurveda. The RAKTA (Red) and SHWETA (White) varieties of both these drugs as mentioned in Ayurveda are determined by red and white flowers of both these species. Due to very easy availability and less controversy about its identity the red flowered *Boerhaavia diffusa* (RAKTA PUNARNAVA) was taken up for experimental, work.

Though, there was a large number of drugs mentioned and practised for the treatment of urinary disorders in Indian system of medicine, we selected 'PUNARNAVA', (*Boerhaavia diffusa* Linn) for the present study because of its very popular use in the treatment of the diseases of urinary system and the possibility of the presence of regenerative property in this drug as its name 'PUNARNAVA' suggests.

At present, the main drawback of reducing the vegetation of *Boerhaavia diffusa* Linn. is the capturing of waste-land (the most suitable for dense vegetation of *Boerhaavia diffusa* Linn.) by the unauthorised and bad elements of the society. Also, the "Waste-land Utilization Scheme" of the Govt. is also a major cause of minimising the vegetation of this medicinally valuable plant.

Thus it is necessary to increase vegetation of *Boerhaavia diffusa* Linn. to meet the medicinal demand of the people as it has the maximum medicinal value as described below:
Medicinal Value:

**Root** - diuretic, good expectorant, used in jaundice, ascites, anasareca, scanty urine and internal inflammation, mixed with dried ginger it is given in urticaria, powdered root is given in several cases of anagarea, root ground in rice water is given internally for snake-bite, also used in scorpion-sting.

**Leaves** - appetiser, alexiteric, used in Ophthalmia, eye wound and in pain of the joint.

**Seeds** - tonic, expectorant, carminative, useful in muscular pain, lumbago, scabies, scorpion-sting, purify the blood and hasten delivery.

Therefore, this experiment was conducted to increase the vegetation of this plant *Boerhaavia diffusa* Linn. with the use of cultural practices using different hormones and fertilizer to meet the medicinal demand of the people.