ABSTRACT

The present thesis entitled “Studies on Phytochemical, Biochemical and Therapeutic Characterisation of Medicinally Important Plant Cleome gynandra L. (Cleomaceae)” describes successful isolation of active bio-principle/s of the plant Cleome gynandra Linn. The thesis is divided into eight chapters.

CHAPTER 1:
Chapter-1, mainly deals with the introduction of the Medicinal Importance of Plant Natural Products: Past, Present and Future with their innumerable applications.

CHAPTER 2:
In Chapter-2, Survey of Literature which motivates both Re-search and Research of the Plant Cleome gynandra L. to add new empirical solutions of many Life-threatening Diseases. Evaluation of Synergistic antagonistic out-come may include new herbal medicine/s to Health Care Management Systems. Most of the reports in India on the plant, Cleome gynandra L. that has been carried out on the white mutant variety, but in North-Eastern region the same plant abundantly found only Pink mutant variety. Extensive research needs to scrutiny this diversity of the plant in this Bio-diverse region.

CHAPTER 3:
Chapter-3 includes Ethanolic extracts of both fresh & dried leaf showed good cell proliferation, in vitro when administrated on Human Cell-line screening, Carcinoma tissue isolated from the larynx of a 56 year old male.
Arthritic cell line upon treatment with Seed Oil of Cleome gynandra, NIH-3T3-ras (Fibroblast Embryo cell-line) gives IC₅₀ Value 50 µg, which was close to standard marketed drugs when compared. The investigation suggests that the alcoholic extract and seed oil could be good drug candidates for diseases like larynx cancer and Rheumatoid arthritis.

CHAPTER 4:
Chapter-4 deals with Brine Shrimp Lethality Assay in vivo examination of isolated seed oil and pigment respectively. Toxicologically investigation reveals fairly non-toxicity of the seed oil and pigment, fulfilling edibility requirement upon seven days
Acute Toxicity Study (p-value < 0.00001). Oil could substitute existing edible oil in the market and the Pigment also can be an Artificial Coloring Agents in common food stuffs and beverages, non-toxic color additives could serve as a primary source of Food Industry, with essential health benefits.

CHAPTER 5:
Chapter-5 comprise the isolation of medicinal principle/s by GC-MS (leaf steam volatile & Seed oil), Triple Quad LCMS/MS, $^1$H & $^{13}$C NMR investigations and endorsed for the first time, the presence of 3-hydroxypropyl dodeca-5,8-dienoate, ((2E,5E,8E,15E,18E)-heptacosa-2,5,8,15,18-pentaenedioic acid) a Conjugated Linoleic Acid (CLA), confirms pelargonidin 3,5-di-O-glucoside derivative and others respectively.

CHAPTER 6:
Chapter-6 describes the Bio-fabricated synthesis of TiO$_2$ nanoparticles were successfully conducted in Conventional Heating as well as Microwave Irradiation of Cleome gynandra L., Melastoma malabathricum & Rosa chinensis were an integrated approach characterized, for the first time.

CHAPTER 7:
Chapter-7 defines the Pharmaco-informatics studies revels that the therapeutically active candidates viz. Kaempferol, Luteolin, Ayanin and Rutin might be significantly acting against Streptococcus Pyogenes, Mycoplasma Bacteria, Epstein-Barr Virus, Cytomegalovirus, Rubella Virus and also to the IGG1 Rheumatoid Factor Antibody respectively.

CHAPTER 8:
Chapter-8 refers to the general conclusion and future scope of the study. The results of the whole work are summarized in this chapter. A brief idea on future scope of studies has also been projected.