7. Summary and Conclusion

The present research work describes phytochemical investigation, pharmacological screening of seed extracts and fractions of *Thespesia populnea* and *Ceiba pentandra*, isolation and characterization of active phytoconstituents.

In present study seeds of both plants were collected and authenticated. Organoleptic, morphological and pharmacognostic characterization of seeds were carried out to justify the identity. The seeds were extracted using successive soxhlet extraction method first with petroleum ether (40-60ºC) and then with ethanol. The extracts TPO, TPE, CPO and CPE were concentrated and dried. Analysis of seed oils extracted was performed using standard I.P. procedures and various analytical techniques like UV, IR, HPTLC and GC-MS. The TPO showed presence of fourteen fatty acids and most are saturated. CPO showed sixteen fatty acids which includes both saturated and unsaturated. One of unusual fatty acid present was dihydrosterculic acid in both seed oils. Unsaponifiable matter from both oils were separated and used for pharmacological screening.

Phytochemical investigation of *T. populnea* and *C. pentandra* showed presence of carbohydrates, proteins, fats and oil, saponin glycosides, flavonoid, alkaloids, sterols, oxalic acid, tannins and phenolic compounds.

All the extracts were tested for their *in vitro* antimicrobial activity against Gram positive, Gram negative bacteria and fungi. Antimicrobial activity of extracts was assessed following well diffusion method to measure zone of inhibition and twofold
serial dilution method to determine MIC values. The TPE displayed most promising antimicrobial activity amongst all tested extracts.

The acute toxicity test was carried out following OECD guidelines 423; all the extracts were found to be safe up to 2000 mg/kg b.w. The extracts, fractions and unsaponifiable matter were evaluated for analgesic, antipyretic, anti-inflammatory and anti-arthritic activities. Extracts, fractions and unsaponifiable matter of *T. populnea* demonstrated comparatively most promising and significant analgesic, antipyretic, anti-inflammatory and anti-arthritic properties than *C. pentandra*. Amongst all tested fractions, ethyl acetate fraction of TPE and unsaponifiable matter TPOUM were showed pronounced effect for all investigated pharmacological screening. The observed activities may be due to the presence of flavonoids in ethyl acetate fraction of TPE and presence of sterols in unsaponifiable matter TPOUM.

The activity guided isolation of phytoconstituents were performed by using column chromatographic technique, which gives isolate KRA-1 from ethyl acetate fraction of TPE and KRA-2 from unsaponifiable matter TPOUM. The separated and purified isolates were characterized by using physical parameters, chemical test, chromatographic and spectral techniques like UV, IR, $^1$H NMR, $^{13}$C NMR and mass spectrometry. The results of these studies support identification and elucidation of KRA-1 as quercetin and KRA-2 as β-sitosterol.

The isolated phytoconstituents quercetin and β-sitosterol have been previously found to be responsible for antimicrobial, analgesic, antipyretic, anti-inflammatory and anti-arthritic activities.
In conclusion, it is evident from above data that extracts of *T. populnea* are endowed to possess antimicrobial, analgesic, antipyretic, anti-inflammatory and anti-arhritic activities and *C. pentandra* showed anti-inflammatory and anti-arhritic activities which support the traditional claims of these plants in skin infection and inflammatory conditions. The activity guided isolation led to quercetin and β-sitosterol which were previously reported to possess evaluated pharmacological properties.