ABSTRACT

Aim and Objectives

The aim of the present research work was to ascertain scientific validity of folklore uses of *Thespesia populnea* and *Ceiba pentandra*. The study was designed with the primary objective to perform qualitative phytochemical investigation of seed extracts and fractions and to evaluate their antimicrobial, analgesic, antipyretic, anti-inflammatory and anti-arthritic activity. Secondary objective of the study was activity guided isolation and characterization of active phytoconstituents.

Material and methods

The authenticated air dried seeds of *Thespesia populnea* and *Ceiba pentandra* were successively extracted by soxhlet extraction using petroleum ether (40–60°C) (TPO; CPO) and ethanol (TPE; CPE) and extracts were subjected to phytochemical investigation. Unsaponifiable matter (TPOUM; CPOUM) and fatty acids were separated from TPO and CPO. A GC–MS analysis of fatty acid methyl esters was carried out. Extracts were tested for their *in vitro* antimicrobial activity against Gram positive, Gram negative bacteria and fungi following well diffusion method and twofold serial dilution method. Ethanol extracts were fractionated using chloroform, ethyl acetate, n-butanol and leaving behind aqueous residue. Extracts, fractions of ethanol extract and unsaponifiable matter were subjected to evaluation of pharmacological properties. Analgesic activity was assessed by heat induced pains (tail immersion model) and antipyretic activity assessed using brewer’s yeast-induced pyrexia model. Inflammation and arthritis was
induced by sub-plantar injection of carrageenan and CFA into the left hind paw of rats to evaluate anti-inflammatory and anti-arthritic activity.

The activity guided isolation of phytoconstituents was performed by using column chromatographic technique and isolates were characterized using various spectral techniques.

**Results:**

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. GC–MS analysis of TPO methyl esters showed presence of fourteen fatty acids, predominant fatty acids were palmitic and stearic acid, whereas CPO methyl ester showed sixteen fatty acids, predominant fatty acids were oleic and palmitic acid.

TPE extract showed maximum zone of inhibition against *Enterococcus faecalis*, *Escherichia coli*, *Klebsiella pneumoniae* and *Candida albicans* and lowest MIC values from 6.25-12.5 µg/ml amongst all tested extracts. All extracts administered orally were found to be safe up to dose of 2000 mg/kg, b.w. Oral administration of TPO and TPE at 200 and 400 mg/kg b.w., TPOUM and fractions of TPE at 200 mg/kg significantly reduced carrageenan and CFA induced paw edema, brewer’s yeast-induced pyrexia and protected rat tail against heat induced noxious stimuli. CPO, CPOUM, CPE and all fractions of CPE showed significant anti-inflammatory and anti-arthritic activity except chloroform fraction. TPOUM and ethyl acetate fraction of TPE demonstrated most prominent results amongst all tested extracts, fractions and unsaponifiable matter.
The observed pharmacological results 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 gives isolate KRA-1 from ethyl acetate fraction of TPE and KRA-2 from TPOUM. The isolates were characterized and identified as quercetin (KRA-1) and β-sitosterol (KRA-2).

**Conclusion:**

In conclusion, the study demonstrated that extracts of *T. populnea* are endowed to possess antimicrobial, analgesic, antipyretic, anti-inflammatory and anti-arthritic activities and *C. pentandra* showed anti-inflammatory and anti-arthritic activities which support the traditional claims of these plants.