Abstract

The present study was undertaken with the aim of investigating the therapeutic potential of *Clitoria ternatea* Linn. seeds and roots against inflammation, hepatic dysfunction, and related conditions, for their anti-inflammatory, hepatoprotective, anti-hyperlipidemic, immunomodulatory, and wound healing activities using experimental animal models.

The seed and root extracts of *Clitoria ternatea* (CT) at 500 mg/kg, p.o. dose showed significant anti-inflammatory activity against carrageenan-induced hind paw edema and pleurisy in rats, and cotton pellet granuloma model as evident from decrease (p<0.05) in volume of edema, exudates volume, leukocyte migration, and granuloma formation when compared with the inflammatory control group. Seed and root extracts also significantly inhibited in vitro protein denaturation and stabilized RBC membrane.

CT seed extract showed significant protection against paracetamol- and CCl₄-induced liver injuries whereas CT root extract showed significant protection against CCl₄-induced liver injury as observed from decrease (p<0.05) in the serum SGOT, SGPT, and ALP. Further, pretreatment with CT seed and root extracts significantly decreased hepatic mast cell infiltration and collagen synthesis based on the decrease (p<0.05) in hydroxyproline content. In addition, both extracts also significantly decreased hepatic lipid peroxidation and increased natural antioxidant defense mechanism which was confirmed from decreased (p<0.05) MDA, SOD, catalase, and increased (p<0.05) GSH levels. These findings were also supported by the histological findings of the liver tissues.

CT seed and root extracts showed significant anti-hyperlipidemic activity against poloxamer-407 and diet-induced hypercholesterolemia as evident by significant decrease in serum TC, TG, VLDL-C, LDL-C, and atherogenic index as well as increase in HDL-C and HDL/LDL ratio when compared with the control group. In addition, they significantly decreased hepatic lipid peroxidation. Further, the fecal cholesterol and bile acid excretion were also significantly increased in extracts treated animals.
CT seed and root extracts showed significant immunosuppressive activity that was evident from decrease in humoral, cell-mediated, and nonspecific immune responses i.e. significant decrease in primary and secondary antibody titers in SRBC sensitized rats, paw thickness of SRBC sensitized rats, neutrophil adhesion, and in vivo phagocytosis when compared with the control group. These effects were comparable with reference drug dexamethasone.

CT seed and root extracts, when administered orally as well as applied topically, showed significant wound healing activity against excision, incision and dead space wound models, as observed by significant increase in wound contraction, tensile strength, and granuloma formation when compared with the control group. These effects were comparable with reference drug cotrimoxazole ointment.

The phytochemical analysis of CT seed and root extracts showed presence of phenolic and flavonoid compounds. Further, the presence of flavonoid compounds was also confirmed by HPTLC studies. Therefore, the pharmacological activity of CT seed and root could be partly attributed to the presence of flavonoid compounds.

Key words: *Clitoria ternatea*, Flavonoids, Hepatotoxicity, Hyperlipidemia, Inflammation, Immunomodulation, Wound healing.