Abstract

Curcuma xanthorrhiza has been widely used in Southeast Asian countries and some part of Thailand as a household remedy for treatment of postpartum uterine bleeding and a tonic. Even so, there has no systematic study on its pharmacological activity. This study aimed to investigate the activities of C. xanthorrhiza in stimulating bile secretion and their effect on biliary constituents in male Wistar rats. Dried ground C. xanthorrhiza was extracted, and resulted in four extracted components consisting of hexane, ethyl acetate (EtOAc), butanol (BuOH) and aqueous extract, respectively. The potency of these extracts of C. xanthorrhiza on bile secretion was investigated and being compared after the intraduodenal administration. The BuOH extract was the most potent choleresis which increased the bile flow rate (BFR) from the base line control of 100% to 179.28±14.28% at 60 min after the injection and followed by EtOAc (171.53±4.33%), hexane (148.28±11.67%) and aqueous extracts (120.43±5.43%) respectively. The choleresis of EtOAc extract was investigated and found to be a dose dependent effect. The maximal dose was at 1 g/kg BW. On the analysis of the biliary constituents, both BuOH and EtOAc extracts markedly lowered the concentration of bile salt, but not the total output. The partially purified fraction of EtOAc extract also gave the similar pattern of response with higher potency. For other biliary constituents, both BuOH and EtOAc extracts (1 g/kg) as well as EtOAc fraction markedly increased the concentrations and outputs of bilirubin, cholesterol and calcium. In contrast, solvent DMSO tended to increase bile salt concentration but the

overall output of bile salt was not significantly changed ($P>0.05$). Hexane and aqueous extracts slightly decreased the concentration of bile salt. Therefore, the active choleretic constituent was likely to be concentrated in butanol and ethyl acetate extracts.

The toxicity of EtOAc extract was tested and found to have low toxic effect. The LD_{50} value in Swiss albino male mice was estimated to be 5.2 g (i.p.) and 12 g/kg (i.g.).

To investigate the possible mechanism of the drug action, the butanol fraction was intravenously injected. It was able to stimulate bile secretion but the peak of action was delayed. It is possible that the intraduodenal injection of the drug provides a direct contact of the drug to the intestinal mucosal cell to secrete gut hormone there after a more immediate response was observed. Alternatively, the action of the drug by different routes might be exerted through different pathways. However, whatever routes of administrations used, the C. xanthorrhiza was able to stimulate the BFR with increasing output of bilirubin and cholesterol while plasma cholesterol was reduced. The drug thereby might be beneficial for treatment of hyperbilirubinemia and hypercholesteremia.