

2<sup>nd</sup> Global Summit on

# Herbals & Natural Remedies

October 17-19, 2016 Kuala Lumpur, Malaysia

## Hepatoprotective activity of isolated flavonoid from the roots of *Hibiscus vitifolius*

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Hepatitis, viral infections, food additives, alcohol, toxic industrial chemicals, and air and water pollutants are the major risk factors of liver toxicity. Carbon tetrachloride (CCl<sub>4</sub>) is a potent environmental hepatotoxin that generates free radicals. Scientific research has supported the hepatoprotective potential of several herbal compounds. *Hibiscus vitifolius* (Family: *Malvaceae*), a medicinal plant is used to treat several ailments in Ayurvedic system of medicine. The root of this plant is traditionally used to treat jaundice by the tribes of Kanyakumari district, India. The present study was aimed to extract the roots of *H. vitifolius* and evaluate hepatoprotective activity in CCl<sub>4</sub> induced hepatotoxic rats to scientifically assess the traditional claim about *H. vitifolius* roots and to fractionate the pharmacologically active extract. The study was also aimed to isolate the bioactive constituents from the soluble fraction followed by evaluation of hepatoprotective activity and to elucidate the structure. *H. vitifolius* roots were successively extracted with petroleum ether, chloroform, alcohol and water by cold maceration technique for 6 days. All the extracts (400 mg/kg b.wt. p.o.) were evaluated for their hepatoprotective activity. The active alcohol extract was fractionated using n-hexane, ethyl acetate and n-butanol and the fractions (200 and 400 mg/kg b.wt. p.o.) were evaluated for hepatoprotective activity. The active ethyl acetate soluble fraction (100 gm) was subjected to column chromatography to elute the active constituent and to establish its structure. The isolated compound (100 and 200 mg/kg b.wt. p.o.) was further evaluated for its acute toxicity and hepatoprotective effect. Hepatotoxic rats were orally treated with extracts, fractions and the isolated compound for 7 days. Silymarin (100 mg/kg) was used as standard drug. Biochemical analysis and histopathology were performed to confirm the activity. Among all the extracts and fractions, alcohol extract of *H. vitifolius* roots (400 mg/kg) and its ethyl acetate soluble fraction (200 mg/kg and 400 mg/kg) showed significant (P<0.001) hepatoprotective effect. A flavonoid glycoside, gossypin was found to be present in this fraction and was confirmed by melting point and spectral data. This was further evident by comparing with the marker compound gossypin by mixed melting point, Co-TLC and Co-HPTLC analysis. The isolated compound showed no mortality or toxic symptoms up to 1 g/kg b.wt. p.o. Oral administration of isolated gossypin (100 and 200 mg/kg b.wt) exhibited the potent hepatoprotective effect against CCl<sub>4</sub> induced hepatotoxicity, as evident by the significant restoration of the biochemical parameters. Histopathological examination also supported the hepatoprotective effect of the isolated compound. The present study validates the traditional use of *H. vitifolius* roots for the treatment of liver disorders and its hepatoprotective effects are attributed to the presence of the flavonoid, gossypin as active agent.

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