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Feasibility of Phenolic Acids Rich Fraction from Gynura procumbens as Potential Antihyperlipidemic Agent

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Abstract : Gynura procumbens is a popular medicinal plant used as a folk medicine in Southeast Asia to treat kidney diseases, diabetes mellitus and hyperlipidemia. The present study aims to investigate the antihyperlipidemic potential of phenolic acids rich fraction (PARF) from G. procumbens in chemically-induced acute and high fat diet-induced chronic hyperlipidemic rats. Ethanolic extract of G. procumbens leaves exhibited significant reductions in total cholesterol (TC) and triglycerides (TG) levels ($P < 0.01$ and $P < 0.001$, respectively) of poloxamer 407-induced rats compared to hyperlipidemic control after 58 h of treatment. Upon bioactivity guided fractionation the antihyperlipidemic activity was found to be concentrated in the PARF, which significantly reduced the TC and TG levels ($P < 0.001$). HPLC analysis revealed that 3,5-dicaffeoylquinic acid; 4,5-dicaffeoylquinic acid and chlorogenic acid are the major compounds in the PARF. Likewise, chlorogenic acid (60 mg/kg) exhibited significant reductions in TC and TG levels of hyperlipidemic rats ($P < 0.001$). Both chlorogenic acid and PARF significantly reduced LDL, VLDL and atherogenic index ($P<0.01$), while PARF increased the HDL ($P < 0.01$) compared to hyperlipidemic control. Both were found to be not cytotoxic against normal and cancer cell lines. In addition, LD50 of orally administered PARF was more than 5,000 mg/kg. Further investigation in high fat diet-induced chronic hyperlipidemic rats revealed that chronic administration of PARF dose-dependently restored the increase in lipids parameters. In summary, the phenolic acids rich fraction of G. procumbens leaves showed promising antihyperlipidemic effect in both chemically- and diet-induced hyperlipidemic rats that warrants further elucidation on its mechanisms of action.

Keywords : Antihyperlipidemic, Gynura procumbens, phenolic acids, chlorogenic acid, poloxamer-407, high fat diet
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