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Research paper

Antioxidant and anti-inflammatory activites of *Clerodendrum* leaf extracts collected in Thailand

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ABSTRACT

Introduction: Clerodendrum plants have been traditionally used for inflammatory related diseases in Thailand. Crude extracts of *Clerodendrum disparifolium* and *Clerodendrum laevifolium* were assessed for antioxidant and anti-inflammatory activities in order to support traditional Thai claims about the therapeutic potential of these plants.

Methods: Ethanol and hexane extracts of leaves were evaluated for the *in vitro* antioxidant activity including phenolic content assay using Folin–Ciocalteu method, flavonoid content assay using an aluminium chloride ($AlCl_3$) colorimetric method, 2, 2-Diphenyl-2-picryl-hydrazyl (DPPH) free-radical scavenging activity assay, total reductive capability assay, total antioxidant activity assay using ferric thiocyanate (FTC) and thiobarbituric (TBA) methods. In addition anti-inflammatory activity was assayed against lipoxygenase.

Results: The phenolic and flavonoid contents, relating with their antioxidant activities, of the extracts ranged from 1167.21–3344.52 GAE/g of dry extract and 9.05–59.91 mg QE/g of dry extract, respectively. Reducing power increased with increasing concentrations of extracts. The lipid peroxidation inhibition was evaluated by ferric thiocyanate (FTC) and thiobarbituric (TBA) methods, which demonstrated the maximum inhibition in ethanol *C. laevifolium* (55.49%) and *C. disparifolium*(96.17%) extracts, respectively. Furthermore the ethanol *C. laevifolium* extract exhibited highest 2, 2-Diphenyl-2-picryl-hydrazyl (DPPH) free radical scavenging activity (IC_{50} 12.70 μg/mL) and also possessed the greatest anti-inflammatory activity (IC_{50} 14.12 μg/mL).

Conclusions: This study indicated that selected *Clerodendrum* leaf extracts exhibited potential antioxidant and anti-inflammatory activities, which could be focus of further phytochemical research and may be applicable as natural medicine.

1. Introduction

Oxidative stress and inflammation underlie the pathogenesis of illnesses.Physiological and biochemical processes in the human body may produce free radicals as by products, which can cause oxidative damage to biomolecules leading to various diseases [1–5]. A number of species in the genus *Clerodendrum*(family Lamiaceae) were widely documented in indigenous systems of medicine throughout tropical and subtropical regions of the world especially Asian and African continents [6]. The presence of antioxidant and anti-inflammatory molecules in these plant species was considerably evident their beneficial actions that led researchers to investigate plant extracts targeting their activity. Antioxidant activity can be characterized with *in vitro* assays *i.e.* phenolic content assay using Folin–Ciocalteu method, flavonoid content assay using aluminium chloride ($AlCl_3$) colorimetric method. 2,2-Diphenyl-2-picryl-hydrazyl (DPPH) free-radical scavenging activity assay, total reductive capability assay, total antioxidant activity assay using ferric thiocyanate (FTC) and thiobarbituric (TBA) methods [7]. Whereas anti-inflammatory activity can be tested against lipoxygenase.In order to assess traditional claims about the therapeutic potential and to screen plants for future phytochemical research, crude leaf extracts of Thai *Clerodendrum* species with anti-inflammatory uses, *Clerodendrum disparifolium* Blume (*C. disparifolium*) and *Clerodendrumlaevifolium* (*C.laevifolium*) were assessed for their *in vitro* antioxidant activity and anti-inflammatory activity against soybean lipoxygenase enzyme.

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