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In-vitro antioxidant potential of the flavonoid glycosides from *Cassia tora* linn. Leaves

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Abstract - The present study aimed to study the anti-oxidant potential of isolated flavonoids from the ethanol extract (70%v/v) of Cassia tora leaves. Three flavonoids were isolated viz Luteolin-7-O-β-glucopyranoside (I), quercetin-3-O-β-d-glucuronide (II) and Formononetin-7-O-β-D-Glucoside (III) from the ethanol extract (70%v/v) of Cassia tora leaves in the previous study. A comprehensive study on the phytochemical contents - total phenolic content and flavonoid content was accessed using Folin-Denis and $AlCl_3$ method respectively. The antioxidant potential of the samples was evaluated using inhibition of hydroxyl radical, 2,2-diphenyl-1-picrylhydrazyl (DPPH), and nitric oxide scavenging methods. The total phenolic content and flavonoid content was found to be 18.60 % w/w and 9.5% w/w respectively. The IC_{50} values of ethanol extract against hydroxyl, DPPH and nitric oxide radical were found to be 270 µg/mL, 190 µg/mL and 130 µg/mL respectively. The radical scavenging activity of the isolated flavonoids decreased in the following order: quercetin (IC_{50} values 15, 14, 18 µg/mL) >formononetin (IC_{50} values 19, 21, 14 µg/mL) > luteolin (IC_{50} values 20, 23, 18 µg/mL) respectively.

Index terms - Cassia tora, flavonoids, HPTLC, antioxidant

I. INTRODUCTION

Free radicals, chemical reactions and several redox reactions of various compounds may cause protein oxidation, DNA damage and lipid peroxidation in living cells [1[. Therefore, oxidation have been claimed to play an important role in human health and causing several diseases, including cancer, hypertension, heart attack and diabetes [2[. However, living organisms have developed antioxidant systems to counteract reactive species and to reduce their damage. These complex antioxidant systems include enzymes, such as superoxide dismutase (SOD), catalase (CAT) and glutathione (GSH) macromolecules and an array of small molecules, including ascorbic acid, α-tocopherol, carotenoids, polyphenols, uric acid and bilirubin. Oxidative damage occurs when this system is overwhelmed. Antioxidants could increase these complex antioxidant systems and protect the human body against free radicals that may cause pathological conditions, such as anaemia, arthritis, inflammation, neurodegeneration, ageing process and perhaps dementias [3]. Free radicals can be scavenged through utilizing natural antioxidant compounds present in medicinal plants. Some medicinal plants have been shown to have both chemopreventive and/or therapeutic effects on human diseases [4].

Many antioxidant compounds from plant sources have been identified as free radical or active oxygen scavengers. Recently, interest has increased considerably in finding naturally occurring antioxidants for use in food or medicine to replace synthetic antioxidants, which are being restricted due to their side effects such as carcinogenicity [5]. Natural antioxidants can protect the human body from free radicals and arrest the progress of many chronic diseases as well as retard lipid oxidative rancidity in food

Flavonoids are powerful antioxidants against free radicals and are described as free-radical scavengers. Flavonoids are important for human health because of their high pharmacological activities as radical scavengers. Flavonoids possess various clinical properties such as antioxidant, anti-inflammatory, antiallergic, antiviral, and anticarcinogenic activities; while some flavonoids exhibit potential for anti–human immunodeficiency virus functions [6]. This activity is attributed to their hydrogen donating ability. Indeed, the phenolic groups of flavonoids serve as a source of a readily available ‘‘H” atoms such that the subsequent radicals produced can be delocalized over the flavonoid structure. Free radical