Original Research Article

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Evaluation of *in vitro* antioxidant, antiglycation and antimicrobial potential of indigenous Myanmar medicinal plants

The Su Moe[a], Htet Htet Win[a], Thin Thin Hlaing[b], War War Lwin[a], Zaw Min Htet[a], Khin Mar Mya[c]
[a] Pharmaceutical Research Laboratory, Biotechnology Research Department, Ministry of Education, Kyaukse 05151, Mandalay Division, Myanmar
[b] Department of Research and Innovation (DRI), Ministry of Education, Yangon 11081, Myanmar
[c] Cell Culture Laboratory, Biotechnology Research Department, Ministry of Education, Kyaukse 05151, Mandalay Division, Myanmar

ABSTRACT

OBJECTIVE: Myanmar has a long history of using medicinal plants for treatment of various diseases. To the best of our knowledge there are no previous reports on antiglycation activities of medicinal plants from Myanmar. Therefore, this study was aimed to evaluate the antioxidant, antiglycation and antimicrobial properties of 20 ethanolic extracts from 17 medicinal plants indigenous to Myanmar.
METHODS: *In vitro* scavenging assays of 2,2-diphenyl-1-picrylhydrazyl (DPPH), nitric oxide (NO), superoxide (SO) radicals were used to determine the antioxidant activities. Folin-Ciocalteu's method was performed to determine the total phenolic content. Antiglycation and antimicrobial activities were detected by bovine serum albumin-fluorescent assay and agar well diffusion method.
RESULTS: *Terminalia chebula* Retz. (Fruit), containing the highest total phenolic content, showed high antioxidant activities with inhibition of 77.98% ± 0.92%, 88.95% ± 2.42%, 88.56% ± 1.87% and 70.74% ± 2.57% for DPPH, NO, SO assays and antiglycation activity respectively. It also showed the antimicrobial activities against *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Candida albicans* with inhibition zone of 19, 18, 17, 25 and 15 mm, respectively. *Garcinia mangostana* Linn. showed the strongest activities for SO and antiglycation assays with inhibition of 93.68% ± 2.63% and 82.37% ± 1.78%. Bark of *Melia* sp. was the best NO radical scavenger with inhibition rate of 89.39% ± 0.60%.
CONCLUSION: The results suggest that these plants are potential sources of antioxidants with free radicals-scavenging and antiglycation activities and could be useful for decreasing the oxidative stress and glycation end-products formation in glycation-related diseases.

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Correspondence: The Su Moe; E-mail: thesumoe@gmail.com.
The Su Moe and Htet Htet Win contributed equally.

1. Introduction

Oxidative stress and nonenzymatic protein glycation may be associated with the very common chronic disease, diabetes mellitus. The formation of advanced glycation end-products (AGEs) is accelerated in hyperglycemic conditions. Oxidation process plays a major role in accelerating the rate of formation of AGEs. On the other hand, AGEs generate reactive oxygen species, in addition to radicals and other reactive intermediates, from autoxidation reactions. Free radical-derived oxidative stress plays a significant role in