

**ANTI-OXIDANT ACTIVITIES OF
SOME LESSER KNOWN LEAFY
VEGETABLES**

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the Master Degree in Food Science and Technology on 31st march 2006**

DECLARATION

The work described in this thesis was carried out by me at university of Sri Jayewardenepura under the supervision of Prof. Arthur Bamunuarachchi and Ms. I. Wickramasinghe and a report on this has not been submitted in whole or in part to any University or any other institution for another degree/ diploma.

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Date of submission

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“We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the Purpose of Evaluation”.

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ABSTRACT

Antioxidants are the chemical species, which has an ability to delay or inhibit oxidations. As People's living condition improves, it is an inevitable tendency that natural antioxidants take the place of synthetic antioxidants. The demand of natural antioxidants will be increased continuously, because of non toxicological effects on animals. Food and medical applications are the major applications of natural antioxidants. Main sources of antioxidants are plants and animals. The research described in this thesis mainly focuses on evaluation of antioxidant activity of lesser known leafy vegetables (Red tampala: *Amaranthus paniculatus*, Kura tampala: *Amaranthus viridis*, Agune: *Tinospora malabarica*, Penela wel: *Cardiospermum microcarpum*, Genda kola: *Portulaca oleracea*. Determination of moisture, ash contents and estimation of chemical constituents, which may possess antioxidant activity of leaf vegetables were also described. Antioxidant activity was evaluated using fish oil modal. Peroxide values (PV) provide information regarding the antioxidant activity of substances. According to the results observed in this study Agune and Genda kola shows the highest antioxidant activity. Lowest antioxidant activity was shown by Kura tampala and Red tampala. Kura tampala show the lowest antioxidant activity and also which is some what similar to synthetic antioxidant BHT. All leaf vegetables had shown chemical constituents polyphenols, Anthraquinones, flavonoids and antocyanins. Red tampala and Genda kola shows the highest and lowest vitamin C.

CHAPTER-1

INTRODUCTION

1.0 Introduction

Our bodies naturally protect themselves against free radicals with a class of substances called antioxidants. Their traditional role is, as their name suggests, is inhibiting the development of oxidative rancidity in fat- base foods, practically dairy product, fried food and meat. More recent research has suggested a new role in inhibiting heart disease, hardening of the arthritis, rheumatism, cancer inflammatory condition, cataracts other visual problems and diabetics, etc in the human body. Foods and medicine will be integrated in world marketing the near future. It will undoubtedly increase the demand for natural antioxidants. The interest in using natural substances is mainly due to the toxicity and the low safety coverage of the synthetic antioxidants.

The stabilization of products of vegetable origin against autoxidation is thus less efficient than the stabilization of animal products. Protection factors of comparable antioxidants are several times higher in lard than in edible oils. The initial concentration of natural antioxidants in plant foods is already near the optimum so that a further addition of antioxidants has only a small effect, but it is useful for those cases when rapid decomposition of antioxidants is expected.

The pro- oxidative activity of iron and other heavy metals is less dangerous in plant materials than that of haeme derivatives in animal products, as plant materials usually also contains metal- chelating agents. The only important oxidation catalyst in raw materials and foods of vegetable origin is a group of lipoygenases and related enzymes.

Over the past fifty years or longer, hundreds of substances derived mostly from vegetable sources have been tested as antioxidants for food lipids. The research reports of related investigations indicate in many instances that such “natural” substances