

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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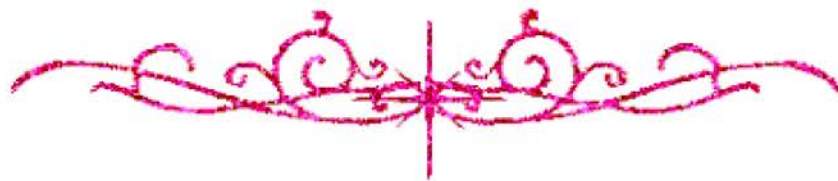
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**CHEMICAL AND TECHNOLOGICAL STUDIES
ON SOME FOODS**

**UTILIZATION OF SOME PHENOLIC COMPOUNDS EXTRACTED
FROM PLANT SOURCES AS NATURAL OIL ANTIOXIDANTS**

By

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Mohamed Fawzy Osman Mohamed Abdou

B. Sc. (Agric.), Tanta University, (1995)

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the Requirements for the Degree*

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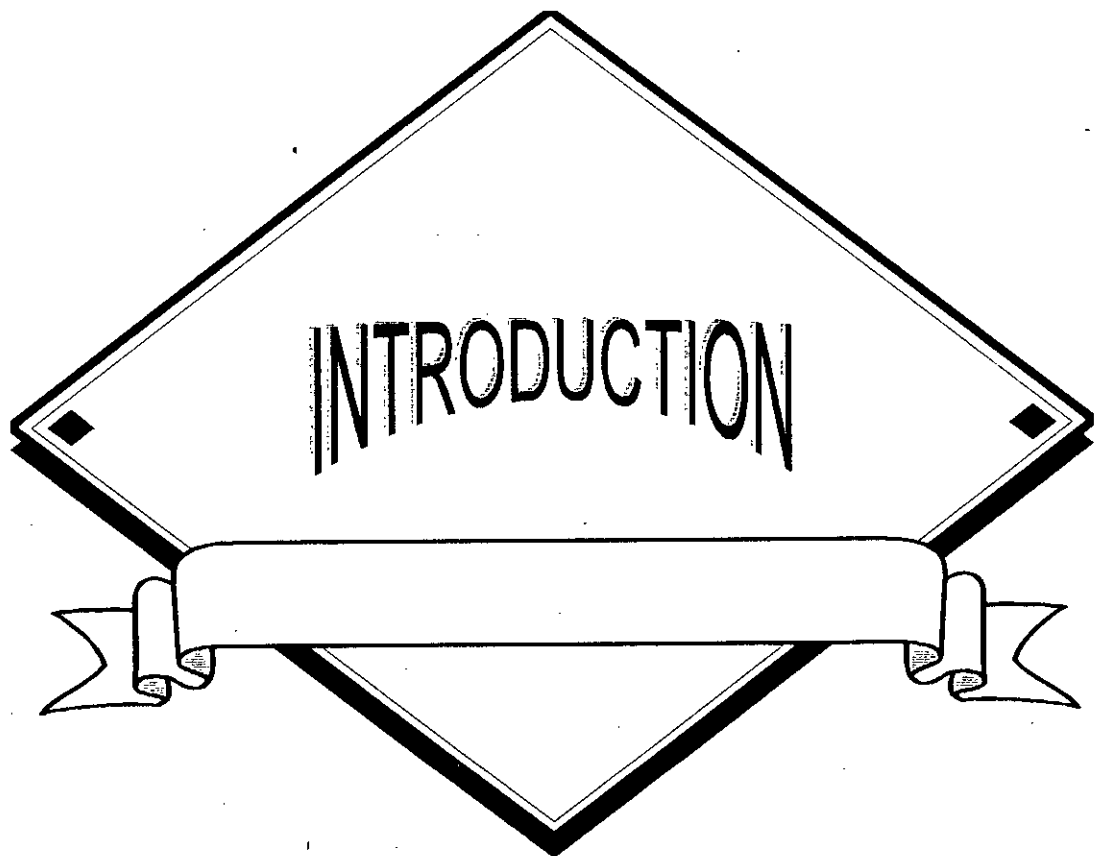
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1- INTRODUCTION

Consumers all over the world are becoming increasingly conscious of the nutritional value and the safety of their food and its ingredients. At the same time, there is an increase in preference for natural foods and food ingredients which are generally believed to be safer, more healthy and less subject to hazards than foods containing artificial food additives (Allen and Hamilton, 1983 and Farag *et al.* 1989).

Since some synthetic antioxidants, such as butylated hydroxy anisole, have been found to be toxic to experimental animals (Ford *et al.* 1980); Natural plant products began to receive much more attention as sources of safe antioxidants (Frankel *et al.* 1996).

The main sources of natural antioxidants are various kinds of plant products such as oil, seeds, cereals, beans, and nuts (Namiki, 1990).

Plant seeds and leaves contain effective antioxidants, such as tea and barley leaves contain strong antioxidants (Osawa *et al.* 1992). An isoflavonoid isolated from young barley leaves inhibited malonaldehyde formation from squalene by almost 100 % upon ultra violet (U. V) irradiation at the level of 10 μ mol/m mol (Nishiyama *et al.* 1993).

Lipid oxidation not only lowered quality and nutritional value of foods, but also was associated with aging, membrane damage, heart diseases and cancer (Cosgrove *et al.* 1987).

Lipid peroxidation initiated by reactive radicals, such as the hydroxy radical, causes many biological damages including atherosclerosis (Iwakami, 1965), liver diseases (Suematsu and Abe, 1982), diabetes (Saito *et al.* 1979), and aging (Sagia and Ichinose, 1980). Moreover, the

formation of lipid peroxides and their secondary products such as reactive carbonyl compounds also causes various kinds of biological damage. In particular, the aldehydic products malonaldehyde (MA), formaldehyde, acetaldehyde, and 4- hydroxy nonenal are known to be mutagenic and carcinogenic (**Marnett *et al.* 1985; Feinman, 1988; Esterbauer *et al.* 1991; Chaudhary *et al.* 1994**).

There is a great need for safe, natural antioxidants, not only to prevent oxidative deterioration in foods but also to inhibit oxidative damages caused by lipid peroxidation. Therefore, antioxidants in foods have recently attracted special interest because they can protect the human body from free radicals which may cause various diseases including carcinogenesis and aging (**Osawa *et al.* 1987; Cutlar, 1992**). These antioxidants can also retard oxidative rancidity caused by atmospheric oxidation and thus protect oils, fats, and fat-soluble components such as vitamins, carotenoids, and other nutritive ingredients in foods.

Addition of synthetic antioxidants can control lipid oxidation in foods. However, use of such compounds has been related to health risks resulting in strict regulations over their use in food products (**Hettiarachchy *et al.* 1996**).

There has been some discussion recently of the undesirable use of synthetic antioxidants, for example, dietary administration of butylated hydroxytoluene (BHT) to rats caused fatal hemorrhages in the pleural and peritoneal cavities and in organs such as epididymis, testes and pancreas. BHT caused also changes in rat thyroids,