Introduction and aim of work

Aflatoxins were discovered about 40 years ago after the devastating loss of poultry in England (Turkey X disease) (Cullen and Newberne, 1994). Aflatoxins are the most toxic and carcinogenic compounds among the known mycotoxins and, therefore, have been extensively studied. These toxins are produced by a number of different *Aspergillus* species (Klich *et al.*, 2000 and Peterson *et al*., 2001). However, in agricultural commodities, they are primarily produced by *Aspergillus flavus* and *Aspergillus parasiticus*.

Aflatoxin contamination of foods and feeds is a serious worldwide problem (Bhatnagar *et al*., 2002 and Yu, 2003) resulting either from improper storage of commodities or pre–harvest contamination in corn, peanuts, cottonseed and tree nuts, especially during drought years.

Aflatoxicosis is a poisoning that result from ingestion of aflatoxins in contaminated food or feed. Aflatoxin poisoning is reported in almost all domestic and non domestic animals like cattle, horses, rabbits, and other non-human primates (Eaton and Groopman, 1994). Aflatoxicoses is also reported in humans in many parts of the world (Bennett and Klich, 2003).

Experiments on many rats showed that aflatoxins especially aflatoxin B_1 (AFB_1) is confirmed as a potential carcinogen (IARC, 1993). Metabolism plays a major role in deciding the degree of toxicity (Eaton and Gallhager, 1994). The initial metabolism of AFB_1 involves three principle types of reactions (a) hydroxylation (b) epoxidation (c) ketoreduction.

Aflatoxicoses in humans was reported in many countries like India, China, Thailand, and several African countries. In African and Asian countries, where environmental conditions favor the aflatoxin contamination, threat to human health from aflatoxins is quiet high. Studies on aflatoxin exposure and incidence of liver cancer in places like China and West Africa showed that the situation was alarming. An association of hepatocellular carcinoma and dietary exposure to aflatoxins was established from patients living in high-risk areas of Kenya, Mozambique, Swaziland,

Thailand, China, Philippines, and the Transkei of South Africa (Groopman and Sabbioni, 1991& Eaton and Groopman, 1994). Aflatoxin also is known to produce membrane damage through increased lipid peroxidation (Galvano *et al*., 2001).

Previous studies have shown that the biosynthesis of aflatoxin B_1 can be inhibited by a number of compounds (Dutton and Anderson, 1980), and extracts of certain plants which are toxic to fungi and may be useful in controlling the fungal growth and mycotoxin production (Steinhart *et al*., 1996). Plant extracts, such as those from garlic and onion, effectively retard growth and aflatoxins production. Natural compounds, such as flavonoids, biflavonoids, sulfhydryl, essential oils and others are also active in aflatoxins inhibition (Goncalez, *et al*., 2001). There is increasing interest in antifungal agents for growth control of mycotoxin producing strains; however, some of the agents have toxic residue problems (Coulombe, 1991).

An extensive research on natural antioxidants revealed the protective effects of the cruciferous vegetables as Cabbage (Whitty and Bjeldanes, 1987), Broccoli (Ramsdell and Eton, 1988) and Brussels (Salbe and Bjeldanes, 1989). The antioxidant effect of plants of the Allium genus was discovered by Dwivedi *et al*. (1998) and Abdel-Wahab and Aly (2003). A great number of aromatic, spicy, medicinal and other plants contain chemical compounds exhibiting antioxidant properties. Numerous studies were carried out on some of these plants, e.g. rosemary, sage, oregano, which resulted in a development of natural antioxidant formulations for food (Miliauskasa *et al*., 2002). Although a lot of plants have been tested for their antimicrobial and anti-mycotoxic effects the vast majority have not yet been adequately evaluated. The search continues to discover plant extracts which have the ability to act as antifungal and antioxidant and in the same time counteract the harmful effect of aflatoxin.

Parsley (*Petroselinum crispum)*, Ginger (*Zingiber officinale Rosc*), Turmeric (*Curcuma longa*) and Rocket (*Eruca sativa*) contain a lot of phenolic and antioxidant compounds in their chemical composition and demonstrated cytotoxicity acute lymphoblastic leukemia cell line (Wong and Kitts, 2006, Stoilova *et al.,* 2007 and Singh *et al.,* 2010). These plants which are used extensively in the Egyptian diet may play an important role in the protection of the harmful effects of aflatoxin B_1.

Accordingly the present study was carried out for:

1- Evaluation of plant extracts of Parsley (*Petroselinum crispum)*, Ginger (*Zingiber officinale Rosc*), Turmeric (*Curcuma longa*) and Rocket (*Eruca sativa*) as antifungal for *Aspergillus flavus*.

2- Evaluation of plant extracts of Parsley (*Petroselinum crispum)*, Ginger (*Zingiber officinale Rosc*), Turmeric (*Curcuma longa*) and Rocket (*Eruca sativa*) as antioxidants.

3- Evaluation of aflatoxins effect on some physiological parameters of male albino rats and the effect of treatment with Parsley (*Petroselinum crispum)* and Rocket (*Eruca sativa*) extracts as protectors against the harmful effect of aflatoxins on some *physiological* and biochemical parameters including Blood parameters: RBCS, WBCS, Platelets, HB content and PCV, liver enzymes: Alanine Amino-Transferase (ALT), Aspartate Amino- Transferase (AST) and Alkaline Phosphatase (ALP) Activities, complete lipid profile : Cholesterol, High Density Lipoprotein (HDL) , Low Density Lipoprotein (LDL) and Triglycerides ; kidney function: Albumin, Creatinine , Urea , Uric Acid tumor markers: α Fetoprotein , Carcinoembryonic Antigen (CEA), Nitric Oxide, Super Oxide Dismutase (SOD) and estimation of lipid peroxidation: Malondialdehyde concentration.