

Role of Potential Compounds in Foods with Particular Emphasizes on Human Health

Muhammad Burhan Khan Tareen^{1*}, Sheeraz Ahmad Khan², Muhammad Bilal Rana², Sahar Haq², Muhammad Saqib Javed³, Alyan Ashraf⁴, Abid Hussain⁵

¹College of Food Science and Technology, Huazhong Agricultural University, China

²Institute of Food Science and Nutrition, Bahauddin Zakariya University, Multan, Pakistan

³Departemnt of Food Engineering, University of Agriculture, Faisalabad, Pakistan

⁴Centre of Agricultural Biochemistry and Biotechnology (CABB), University of Agriculture Faisalabad, Pakistan

⁵Department of Agronomy, University of Agriculture, Faisalabad, Pakistan

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*Corresponding author: Muhammad Burhan Khan Tareen

Abstract

Human nutrition is the process by which substances in food are transformed into body tissues and provide energy for the full range of physical and mental activities that make up human life. Antioxidants that usually taken through diet and have an important role in inhibition of stress due to oxidation that reason for beginning and development of numerous diseases such as cancer, and much other disease such as diabetes and also inflammation. There are certain gaps in literature about the different activities in compounds that exhibit functions in vegetables and fruits. Different free radical leads to oxidative stress to the particular cell and ultimately causes the cancer. The natural phenolic compounds have received increasing interest in the last years, since a great amount of them can be found in plants and consumption of vegetables and beverages with a high level of such compounds may reduce the risk of development of several diseases due to their antioxidant power, among other factors. Kaempferol as one of the flavonoids that main function involved in binding with cells of the cancer and ultimately kills the cancer cells. Anthocyanin mainly the type of the major compound in the outer portion of the skin of the onions The colour of the red showing the activities against the free radicals depending on the type as well as the nature of the chemical compound. Quercetin as the valuable type of the flavonoids that have been used in the purpose of the preventing diseases associated with the bacteria as well as the viruses. Different free radical leads to oxidative stress to the particular cell and ultimately causes the cancer.

Keywords: Human Nutrition, Foods, Biotechnological applications, cancer, antioxidants.

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INTRODUCTION

Carbohydrate, fat, and protein are, to a large extent, interchangeable as sources of energy. Typically, the energy provided by food is measured in kilocalories, or Calories. One kilocalorie is equal to 1,000 gram-calories (or small calories), a measure of heat energy. However, in common parlance, kilocalories are referred to as “calories.” In other words, a 2,000-calorie diet actually has 2,000 kilocalories of potential energy. One kilocalorie is the amount of heat energy required to raise one kilogram of water from 14.5 to 15.5 °C at one atmosphere of pressure. Another unit of energy widely used is the joule, which measures energy in terms of mechanical work. Throughout most of the world, protein supplies between 8 and 16 percent of the energy in the diet, although there are wide variations in the

proportions of fat and carbohydrate in different populations [1].

Human nutrition deals with the provision of essential nutrients in food that are necessary to support human life and good health. Poor nutrition is a chronic problem often linked to poverty, food security or a poor understanding of nutrition and dietary practices and poor knowledge about nutrients required by the body at various stages of life to prevent deficiency of nutrients in body which can have adverse effects on body [2,3]. Malnutrition and its consequences are large contributors to deaths, physical deformities and disabilities worldwide [4]. Good nutrition is necessary for children to grow physically and mentally, and for normal human biological development [5].

Quercetin is a strong antioxidant found in many plants and it is widely used in dietary supplements. Bacteria *Bacillus cereus* transformed quercetin to isoquercetin (quercetin 3-O-glucopyranoside) with 20.0% yield. Whereas, fungus *B. bassiana* ATCC 7159 transformed quercetin to

quercetin 7-O- β -D-(4''-O-methyl)-glucopyranoside with 87.0% yield, and *Cunninghamella elegans* ATCC 9245 to quercetin 3-O- β -D-glucopyranoside with 55.7% yield transformation of quercetin and its glycosides due to metabolism by intestinal bacteria[6].

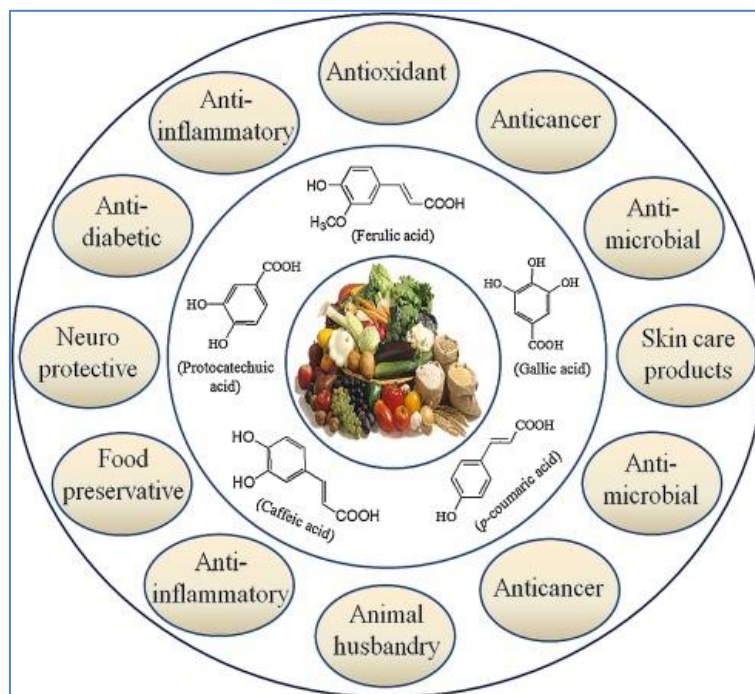


Fig-1: Shows the Foods with natural compounds against diseases

There are certain gaps in literature about the different activities of the extracts of the onion. The antioxidant activity of the onion extract remains unclear and not completely studied yet. Different free radical leads to oxidative stress to the particular cell and ultimately causes the cancer. The further study needed to understand the nature of different chemical compounds in onion that responsible for antioxidant activity as well as for the different routes for entry of free radicals into the living.

Antioxidant activity

Red the type of onions displaying maximum effect of DPPH scavenging as compared to other types of onions that are less scavenging ability. The assay in relation to DPPH indicated that for comparison of onions with higher concentrations of anthocyanin as well as quercetin has a tendency to display high power of antioxidant. A study showed that using of onion that red in colour leads to enhance plasma level and also their activity of enzymes such as superoxide dismutase

also glutathione peroxidase with the decreases in concentration of malondialdehyde that found in cells of liver [7].

Previous study on the onion showed that extracted obtained from onion contained the polysaccharide displaying activity against oxidants called antioxidant activity towards ABTS that commonly used in the assay linked to enzymes that function to bind cations, and also scavenging of the radicals of superoxide anion. Some of the recent research related to the compounds found in onions showed that onions possess the compounds with great potential among the all major plants that majorly used to treat the disease such diabetes, cancer. Onions also showing the activity against the free radicals. Lots of ways existed to inhibit the mechanism of the oxidants during metabolism. The cellular level ultimately caused the formation of the free radicals due to the more level of oxidants in the specific cell [8].

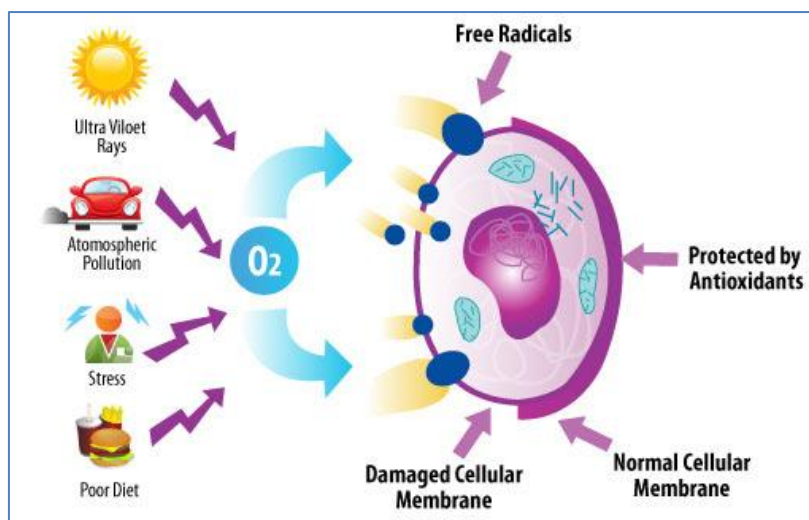


Fig-2: Shows the mechanism of free radicals in relation to cell membrane

Role of Kaempferol as Antioxidant

Kaempferol as one of the flavonoids that showing complexity structure and stable in nature. It also showed relation to the different chemical compounds due to its antioxidant properties. It was used in the cooking as well as for medical purposes. It contains the special structure that work against the cancer. Its main function involved in binding with cells of the cancer and ultimately kills the cancer cells. It also used as a source of the medicinal medicinal plant for the purpose to treat the diseases associated with cancer. It also binds to the cells of the heart and prevents the cells of the heart for the attack to cells of heart. It also reduces the high level of the pressure on the cells of the heart due to its antioxidant properties. The cellular level ultimately caused the formation of the free radicals due to the more level of oxidants in the specific cell. It has been acting high level of the antioxidants for the capturing of the free radicals that are produced due to the abnormal chemical reaction of the body. It then binds to the free radicals and final remove them from the body by no side effects to the cells of the body [9, 10].

There are certain gaps in literature about the different activities of the extracts of the onion. The antioxidant activity of the onion extract remains unclear and not completely studied yet. Different free radical leads to oxidative stress to the particular cell and ultimately causes the cancer. The further study needed to understand the nature of different chemical compounds in onion that responsible for antioxidant activity as well as for the different routes for entry of free radicals into the living[11].

Kaempferol acting the major flavonoid that has been medically used to treat the diseases of the heart. Normally, the cells of the heart need the proper supply of the gas namely nitrogen oxide. When these compounds properly reach to the cells of the heart, then heart performs its functions in such conditions that are associated with any of the normal conditions of the

body. Nitrogen synthase works at the certain biological conditions then, nitrogen oxide not supplied to cells of the heart. This nitrogen oxide works in the presence of the enzyme called nitrogen oxide synthase that is effectively involved in the proper supply of the nitrogen oxide to the cells of the heart. If there more of the supply of the nitrogen synthase, then the cells of the heart not work and can undergo the condition called the death of the cells of the heart. All these conditions would be harmful to the functions of the cells of the heart when there more or less supply of the nitrogen oxide [12, 13].

Role of Anthocyanin as Antioxidant

Anthocyanin mainly the second type of the major compound in the outer portion of the skin of the onions that makes the colour of the onions bright when there large of the light usually the light when falls on the plants on the onions. Different studies were made on the different types of the onions depending of the colour and presence of the pigment such as the anthocyanin. The red type of the onions has the more of the concentrations of the anthocyanin and hence the colour of the red brighten. The skin of the onions also attracts the customers as wells the farmers in the marketing. The white type of the onions has the less of the concentrations of the anthocyanin and hence the colour of the onions of this type usually contains the darker. The last type of the onions has the normal concentrations of the anthocyanin and hence the colour of the red showing the activities against the free radicals depending on the type as well as the nature of the chemical compound [14].

The role of the anthocyanin in the metabolism effectively important to inhibit the free radicals that are produced abnormally and necessary to inhibit them in that termination of the reactions usually they started in the body. The cellular level as well as the molecular level ultimately causes the formation of the free radicals due to the more level of oxidants in the specific cell.

Antioxidants, the major and effective source of flavonoids to inhibit the mechanism of the oxidants [15,16]. Then the anthocyanin acting in the reactions occurred for the formation of the compounds that important for the growth as well as removal of the toxic substances from the body as the product in the form of the waste. Anthocyanin in the onions as the flavonoids helping to lower the pressure that causes the veins of the blood to shrink as well as also leads to the provides the immunity to cells that acting as the natural booster with frightening the against the free radicals. They also remove the products from the oxidants from the body if remains in the body that ultimately leads to the toxicity [17].

Role of Quercetin as anticancer

Quercetin as the flavonoids that mandatory part of the food has been used in the past when it cultivated. This category of flavonoids that possess the several characteristics such fighting against the free radicals. It particularly involved to remove the free radicals that produced biochemically in the specific organ in order to keep as well as minimize the effects produced by the free radicals. Quercetin helps to prevent the cancer by attacking the free radicals that would attack on the normal cells and ultimately to the death of the many of the cells that are significant part of the body. It has many of functions in the body such inhibiting the free radicals as well as prevention of the cancer. It also reduces the stress faced by the cells of the blood such the RBCs. When there is more of the stress faced by the RBCs, then finally there is less supply of the oxygen to important part of the body such the lungs and due to less supply of the oxygen, death of the many tissues occurs finally. They attacked the cells of the body and overall all the reactions in the body would inhibit as well as blockages due to the chemicals such as the toxins that can be produced in the cells or can be produced outside of the cells [18].

Most of the toxins that produced by bacteria in the cells affected to the different parts of the body. Then, quercetin that present in highest concentration in

the onions inhibit involved in the blockage as well as the growth at the initiation point when the bacteria as well as viruses enter in the body in a specific way. The high concentration of quercetin leads to less growth of the bacteria as well as viruses [19].

Most of the studies provide evidences about two types of the quercetin that found in the inner position of the onions. The presence of these two types of chemical compounds significantly reduced the entrance of the free radicals by binding as well as removing from the body. The first type of the quercetin 3,4 -O-beta-diglycopyranoside that actually formed when quercetin combines with glycosides in the specific positions and ring like and heavy structure is obtained that is effective blockage the oxidants as well the free radicals. When quercetin combines with glycosides in the specific positions and ring like and heavy structure obtained that particularly effective for blocking the oxidants as well as the free radicals. When both of these types taken from the onions, less chances of the free radicals to attack the body and hence less of the damage caused by free radicals due to high concentrations of the flavonoids[20].

The free radicals also inhibited the electrons in the metabolic events that occurred in the formation of the useful and variety of the lipids. But the oxidants attack on the cells of the lipids and disturbed the membrane of the cell by taking the electrons that involved in the formation of the formation of the proteins in combinations with lipids that categorized as the conjugated to perform the functions of the cells effectively. The antioxidants also helpful in regulating biochemically the events occurring during the formation of anabolism as well as catabolism. The major type of antioxidants that showed activity against free radicals by blocking them when attack occurs on the membrane of the cell. Higher of the concentrations of the flavonoids like quercetin, less the attacked of the free radicals that blocked initially by treatments with onions taken through the diet[21,22].

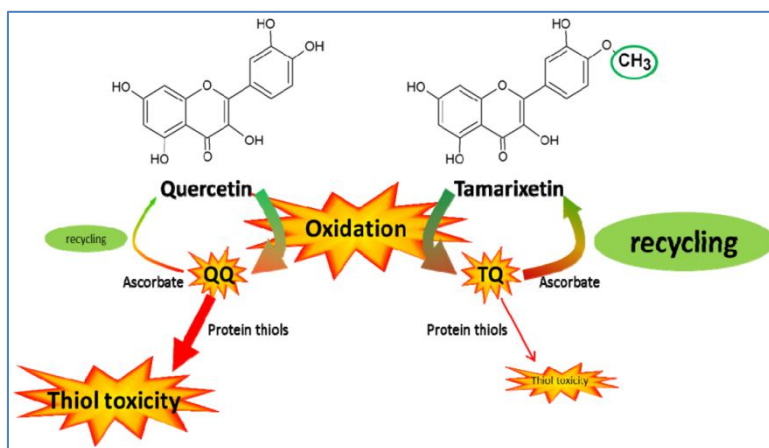


Fig-3: Shows the role of quercetin with free radicals

Quercetin as the antioxidant playing important role in making the important composition of the onions helps to reduce the lipids peroxidation by removing the free radicals that are attached to the specific chain of the lipids. It also important to inhibit these free radicals at the starting of the chain because once these attached then difficult to remove them. These radicals then started the chain the ultimately inhibited the overall reactions of the synthesis of the lipids. Less formation of the lipids occurred in the cells of the brain then the sheath of the brain that made of the lipids also disturbed. As ultimately leads to attacked to the cells of the brain once the injury occurs. It also causes if the damages to membranes of the cell that actually most of the lipids that playing important role in overall the process occurring in the body. The formation of the ketone also dependent on the formation of the lipids because moreo formation of lipids leads to of the formation of the ketone in the body. If there is high concentrations of the lipid there no of the more of the formation of the ketone in the body[23,24,25].

Quercetin also involved in the lowering the risks of the diseases majorly associated with cancer as well as heart[26,27]. The antioxidants posses with a certain properties that differentiated them to the other members of the other compounds found and active in the onion. The cells of the heart attacked by the free radicals that involved in the oxidation of the lipids[28]. Once the layer of the lipids in heart deposited mistakenly more of the lipids accumulated in the outer layer of the heart and ultimately damaged it at the alarming and most of the patients suffered from the attacked to the heart and then finally death of the in these patients are severally occurred[29,30]. Lipids in the one way has benefit to the membrane of the brains by protecting them injuries as well as severe attack while in most of severe types of the cases of the deaths occurred due to more of the lipids in the outer layer of the cells and causes the global issues in the world[31].

A food is something that provides nutrients. Nutrients are substances that provide energy for activity, growth, and all functions of the body such as breathing, digesting food, and keeping warm; materials for the growth and repair of the body, and for keeping the immune system healthy [32-34]. Every cell in the body depends on a continuous supply of calories and nutrients, whether obtained through food, IV nutrients, or tube feedings. Eating and food, however, also have symbolic meanings associated with love, sensuality, comfort, stress reduction, security, reward, and power [35].

CONCLUSION

The free radicals also inhibited the electrons in the metabolic events that occurred in the formation of the useful and variety of the lipids. Kaempferol acting the major flavonoid that have been medically used to treat the diseases of the heart. Quercetin as the valuable

type of the flavonoids that have been used in the purpose of the preventing diseases associated with the bacteria as well as the viruses. It becomes difficult to stop the growth of the bacteria as well as viruses when these enter into the body.

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