

## « Citrussinensis »Pericarp from Algeria an Aromatic Additive

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### Abstract

Citrus fruits are acidic fruits which contain healthy nutritional content that works wonders for the body. It acts as a fabulous source of vitamin C and a wide variety of essential nutrients required by the body. Fresh fruits and their hand-squeezed or industrially processed juices contain mostly flavanones and flavones. This study was to utilize the powder from the peel of Citrussinensis in bread. Citrus peel can find a variety of applications in food industry.

### Keywords

*Citrus sinensis* peel; powder; food;antimicrobial activity;antioxidant activity

### Introduction

The genus Citrus, belonging to the *Rutaceae* or Rue family [10], comprises of about 140 genera and 1,300species. *Citrus sinensis* (Orange), *Citrus paradise* (Grapefruit), *Citrus limon* (Lemon), *Citrus reticulate* (tangerine), *Citrus grandis* (shaddock), *Citrus aurantium* (sour orange), *Citrus medica* (Citron), and *Citrus aurantifolia* (lime) are some important fruits of genus Citrus. Citrus are well known as one of the world's major fruit crops that are produced in many countries with tropical or subtropical climate. Brazil, USA, Japan, China, Mexico, Pakistan, and countries of the Mediterranean region, are the major Citrus producers [1,5].Worldwide, Citrus production is estimated to be at levels as high as 105 million metric tons (MMT)per annum, Brazil being the largest producer with contribution of 19.2 MMT followed by the United States. Pakistan with an annual production ca. 1.76MMT of Citrus fruits stands among the ten top Citrus producing countries of the world. Citrus fruits and their by-products are of high economic and medicinal value because of their multiple uses, such as in the food industry, cosmetics and folk medicine. In addition to large scale consumption as fresh fruits, the Citrus fruits are mainly processed to produce juice. The waste of Citrus processing industry left after juice extraction, such as peels, seeds and pulps, corresponding to about 50% of the raw processed fruit, can be used as a potential source of valuable by-products. Specifically, the Citrus peels, commonly treated as agro-industrial waste, are a potential source of valuable secondary plant metabolites and essential oils. The orange fruit is composed of an external layer (peel) formed by flavedo (epicarp or exocarp) and albedo (mesocarp), and an inner material called endocarp that contains vesicles with juice. The seeds are usually embedded at the centre

of the fruit, indirect contact with the juice sacs.[3]

These health benefits are as a result of vitamins, especially vitamin C[9], photochemical compounds like liminoids, synephrine, hesperidin flavonoid, Polyphenols, pectin etc. A single orange is said to have about 170 phytonutrients and over 60 flavonoids. [8]

### 2-Materials and Methods

The study was conducted in the University of Mustapha Stambouli- Mascara –Algeria

#### Plant materials

Oranges (*Citrus sinensis*) were purchased from local market in February and March 2016.

#### • Samples

➤ Bread

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## • Methods

### ➤ Preparation of Plant Materials

The peels were carefully washed under running tap water followed by sterile distilled water. These were sun dried for seven days, pulverized to a fine powder using a manual grinder

### ➤ Preparation of bread

The bread is manufactured a partir of the following ingredients : flour, water, salt and yeast " Saccharomyces cerevisiae" while preparing our powder is added

## 3-Results and Discussion

### • Volume

When the powder dose increases, the volume decreases, then these orange peel powders contain substances that affect the yeast " Saccharomyces cerevisiae "

### • Color of the crust

Samples containing added orange peel powder have a darker color than the control; because the bark is rich in protein and carbohydrate .This can increase the possibility of non-enzymatic browning

### • Gout

The addition of this powder in bread gave a pleasant taste

### • Discussion

The antimicrobial potency of plants is believed to be due to tannins [2],saponins, phenolic compounds, essential oils [6] and flavonoids. These compounds are known to be biologically active and therefore aid the antimicrobial activities of the plants. These secondary metabolites exert antimicrobial activity through different mechanisms. Tannin as observed in Citrus cinensis peel extract have been found to form irreversible complexes with proline rich protein resulting in the inhibition of cell protein synthesis. Citrus plants could be regarded as medicinal due to the high level of flavonoid content in them[11].

A high quality orange is one that is mature with good color intensity uniformly distributed over the surface. Such oranges must be firm with a fairly smooth texture and shape that is characteristic of the variety, free from decay, defects and other blemishes. The biological activity and the healthy effects of citrus flavonoids as antioxidants have been reported. These group of pigments as found in plants and together with anthocyanin play a role in flower and fruit colouration. Also, they are present in dietary fruits and vegetable, and exercise their antioxidant activity in several ways, including the activities of metal chelation . Studies indicate that flavonoids are excellent radical-scavengers of the hydroxyl radical , due to their to

ability to inhibit the hydroxyl radical and donate hydrogen atom. Oranges as excellent source of vitamin C[4]contain powerful natural antioxidant, folate, dietary fibre and other bioactive components, like carotenoids and flavonoids that prevent cancer and degenerative diseases. Consumption of foods rich in vitamin C improves body immunity against infectious agents and scavenging harmful, pro-inflammatory free radicals from the blood. Sweet orange contains a variety of phytochemicals like hesperetin and naringenin. Naringenin has a bioactive effect on human health as antioxidant, free radical scavenger, anti-inflammatory, and immune system modulator.

## 4-Conclusion

The citrus peels are rich in nutrients and contain many phytochemicals with strong potential for use in drug production or as food supplements. Our results are in agreement with theseassertions as a range of phytochemicals viz; alkaloids, terpenoids, tannins, flavonoids, saponins, cardiac glycosides, steroids were detected in the orange peels and seeds extracts. [11]

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