

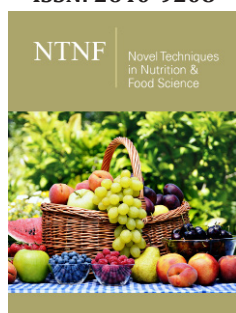
The Numerous Benefits of Banana Peel Wastes in Biomedical Application: A Mini Review

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Abstract

Supplements and bioactive compounds in natural products are basic to lead a solid life. The utilization of natural product has expanded around the world to procure anticipation from malady. Banana peel squanders are exceedingly regular and perishable but considered as natural disturbance. Each year, impressive amounts of banana peels are comparable to 40% of the real weight of new bananas and frequently produced as squander. As of late, analysts picked up colossal consideration on biomedical applications such as antimicrobial, antioxidant, anti-inflammatory, anti-cancer movement of banana peel to decrease the taken a toll increment in healthcare businesses. The current examination recaps the biomedical applications and its usage as modern biomaterial for wound recuperating applications.

Keywords: Banana peel wastes; Antioxidant activity; Anti-inflammatory activity; Wound dressing; Medicinal industry

Introduction

Bananas are one of the most popular fruits and have a lot of vitamins and minerals. Around 35% of the total weight of the fruit comes from the peel [1]. Every year, about 36 million tons of banana peels are made. It has a lot of fiber and phenolic compounds. The material has strong abilities to fight off harmful substances, bacteria and microbes [2]. This fabric is new and can be used in the nutraceutical and pharmaceutical industries. It gives energy and is modern. Banana peels are usually thrown away as farming waste, but they can be used to make good food [3]. In some places, people eat banana peels and use them as medicine. It has huge benefits for health and can be used as a basic ingredient in the food industry. It contains chemicals that can fight against diseases, bacteria and cancer [4]. Banana peels contain substances that can be harmful to the body, like glycosides, alkaloids, oxalates and phytate. They also have 18 different kinds of amino acids in them, but in varying amounts. After analyzing the color of the banana peels, the ripe ones were identified for harvesting. Once the fruits reached optimal ripeness, they were harvested accordingly. It was found that oxalates are present in the skin of bananas [5]. Consuming banana peels can lead to the formation of compounds in the body that interact with calcium and oxalates, potentially causing harm to tissues and blood [6]. This review article highlights crucial points regarding the utilization of banana peel (Figure1).

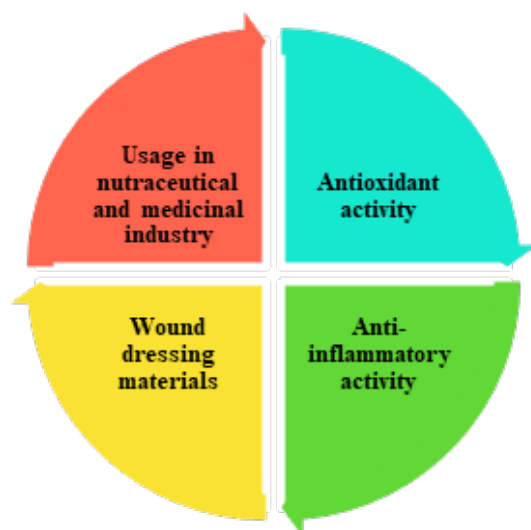


Figure 1: Important points about using banana peels.

Antioxidant activity

Kumari and others in 2020, analysts looked at how banana peels can make you feel way better by acting like cancer prevention agents [7]. The acetone extricates of banana peel effectively expelled the DPPH and ABTS free radicals. The capacity to evacuate hurtful free radicals progressed as the sum of extrication expanded from 10µg/ml to 100µg/ml [8]. At a concentration of 100 micrograms per milliliter, the extricate appeared the most noteworthy antioxidant action with values of 71.21 furthermore or short 0.91 and 86.78 additionally or short 0.88. The extricate has solid antioxidant capacities, with an IC50 of 36.2% in DPPH and 44.6% around 40% of exercises that evacuate radicals were calculated [9]. Banana peel extricate makes a difference cells work superior by getting freed of destructive substances called free radicals. It was demonstrated when there was a 40% diminish in these destructive substances. Shanthi and others in 2011, analysts considered how banana peels at distinctive readiness levels can ensure ruddy blood cells from harm caused by oxygen [10]. They too looked at how banana peels can act as cancer prevention agents. Banana peels are extra from making banana juice and have solid stuff like polyphenols and cancer prevention agents in them. This think about found that unripe banana peels have more cancer prevention agents than ready or overripe banana peels [11]. Gonzalez and others in 2010, it was found that acetone and water extricate were way better at ceasing fats from going awful or getting freed of destructive atoms in a chemical framework containing beta-carotene and linoleic acid. The skin of a banana incorporates a part of dopamine and L-dopa, which are cancer prevention agents [12].

Anti-inflammatory activity

Aggravation is how your body ensures itself when it gets harmed or contaminated by destructive germs. It can crush, weaken, or piece off the hurtful germs and the harmed tissue [13]. Nitric Oxide (NO) may be a solid substance that causes organ irritation and is included in numerous substantial forms like protecting the body, broadening blood vessels and both short-term

and long-term organ irritation. The NO made by actuated fiery cells can murder microscopic organisms, infections and tumor cells. Whereas it makes a difference ensure the body, it can moreover cause short-term and long-term swelling [14]. Camberos and others found that extricates from banana peels made a difference wounds mend speedier in male rats by making the skin thicker and expanding the sum of collagen strands and cells that offer assistance with mending [15]. Atzingen and other analysts looked at how viable a gel made from banana peels was at diminishing swelling. They found that it worked way better after 14 days taking after surgery. This inquire about appeared that the more anti-inflammatory impacts a treatment has, the quicker the mending time. Ferreira and other researchers made new types of plastic film from banana peel, chitosan, and Andiroba oil. They studied and described the properties of these films [16]. Chitosan has great natural abilities, but it doesn't have the ability to fight off germs or reduce inflammation. To compensate for this, green banana peel extract and andiroba oil are utilized due to their excellent natural healing properties for wounds. Man-made plastic films have been observed to attract water and have a contact angle of less than 90 degrees. The green banana peel extract and andiroba oil helped the film retain moisture, adhere to cells and retain moisture, enabling it to effectively treat skin wounds and aid in wound healing [17].

Wound dressing materials

Analysts are truly inquisitive about making gauzes for cuts and wounds out of normal things to assist them mend speedier. An unused sort of wound dressing made from lignin, like banana peel and chitosan film was made to assist progress wound mending. In specific, banana peels were utilized since they can offer assistance your skin mend and grow back [18]. Different sums of banana peel were blended with chitosan as a filler within the blend. Including banana peel in the wound dressing helped to diminish the sum of water swelling in it. The test appeared that *Staphylococcus aureus* is the foremost effectively influenced microbes in wound dressing. So, a film made with banana peel and chitosan might be utilized as a great fabric for treating wounds [19]. Alborzi et al (2021) made a new type of wound dressing using chitosan and tested it with potato starch, banana peel powder and sesame oil to see how strong and flexible it is. The banana peel powder with 7% weight showed really good strength and durability. The study found that banana peel powder was mixed well into the wound dressing material [20]. The dressing also showed promise in fighting bacteria. *Aureus*, *E. aureus* and *E. Coli* bacteria were reduced when banana peel powder was added to the mixture. The study found that using banana peel powder in a new kind of bandage made blood vessels grow faster [21].

Usage in nutraceutical and medicinal industry

The skin of a banana can help make your teeth whiter and has lots of good stuff for your teeth. Brushing your teeth with a banana peel gives them potassium and makes them stronger. The special substances in banana peel can also help stop cancer [22-24]. The MCF-7 cells' ability to function decreased by 91%. The rise in Nendran banana peel extract from 20 to 200 grams per

milliliter led to a boost in antioxidant activity, increasing from 14% to 247%. People used banana peels to heal cracked heels, especially in women with dry and thick skin on their feet. This happens because when the skin on the foot breaks, germs can enter and cause infections that can make the foot swell. The mixing of carboxyl methyl cellulose and banana peel extract results in a gel [24-26]. This gel works better than other chemicals and is good for the environment. Banana peels can help heal wounds quickly and are also good for the environment. Rubbing the inside of a banana peel can help reduce itching and redness from mosquito and insect bites [27-32].

Conclusion

There has been a huge demand for the use of natural medicine all around the world. Researchers are interested in natural drugs because they have fewer side effects than regular drugs. Different studies have found that certain substances can help heal wounds, by reducing inflammation, fighting harmful substances, and repairing cells. Researchers need to study the different chemicals in banana peels to see if they can be used to make new wound dressings that help wounds heal better. Banana peels are good for health because they have a lot of antioxidants and can reduce inflammation. It's used to heal skin wounds and fight cancer because it has properties that fight bacteria. It also meets the requirements.

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