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A Review on Food Wastes for Manufacturing New Food Products

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Abstract

Food waste utilisation is the very current global concern at today's world. Fruits and vegetables are the foremost part of balanced diet. The cycle of healthy diet is not fulfilled without fruits. Furthermore, fruit peels possess also great benefits for people health. Researcher are trying to make new food products from different food wastes. From recent research study it was found that pomegranate peels, mango peels, orange peels, banana peels which contribute enormous good efficacy to provide good health status. These waste constituent help to develop different new fortified food products, which contain lots of bioactive compounds that helps to mitigate acute to chronic ailments. This review article will be discussed an up-to-date information about uses of food wastes for manufacturing new fortified food products.

Keywords: *food waste, new food products, bioactive compounds, human health, fruits, vegetables, fortification.*

1. Introduction:

According to median formula of food wastes, people are involved to produce near about 68 kg of food wastes in every year, among this 49% food wastages are circumvented (Huho et al., 2020). Superfluousof food arises at some phase of the food supply series including manufacturing, industrial refining, merchandise, and intake. Furthermore, wastage of food is defined as food which is not imbibing. Globally, quantity of food wastages varies among one third and one half of all food generates (Bellemare et al., 2017). In developed countries, left over part of food is generated at the time of manufacturing onthe other hand, in developing countries, approximately, 100 kg of food/ person/year are scraped at the imbibing phase (Makanjuola et al., 2020). Literature review has also stated that, 400-500 calories are nominated as food wastes/day/human in developing countries. Simultaneously, 1500 calories are going to as unwanted/day/person in developed countries (Haley et al., 2021). In accordance with FAO, 2019 survey, has highlighted that, more or less 9.5 million people are undergo in great food insecurity (Adedayo et al., 2020).

Food wastes is very much updated global thriving apprehension and also an important matter which is required to be solved as well as increase food security besides enhances the outflow of greenhouse gas, establishes developed nutritious food products, and absolutely decrease the tendency of chronic health issues. According to established Sustainable Development Goals (SDG) 12.3 schedule, objective of food wastes emission is decreasing the amount of left over part of foods by year 2030 (Akerele et al., 2017). In very recent report, authors have delighted that, people are very much aware about their enhanced perception on fermented & bioactive rich foods consumption (Coman et al., 2020). Bioactive substituents of food wastes are now included in healthy diet of people which carries lots of bioactive compounds (Guiné et al., 2020). Presence of bioactive compounds of food wastages aredepended on types of fruits (Campos et al., 2020). Scraps amount of fruit peels have very much low costas well as these are renewable sources, from which fermented food products may be generated and is utilised as functional and nutraceutical enrich foods. Four fruits peels for instance pomegranate peels, mango peels, orange peels, banana peels are very much used to get a new developed fermented food constituent these are beneficial for health to remove all kind of illness as these contain secondary metabolite (Mateos-Aparicio & Matias, 2019). Bioactive components are defined as 'natural or syntheticcompounds with the capacity to interact with one or more components in the living tissues and exerting a wide range of effects' (Essien et al., 2020). This review article establishes the bioactive components of fruit peels as well as utilisation of fruit peels which have beneficial components and also are nutrientdense, have elaborately discussed.

1.1 About fruit peels

1.1.1 Pomegranate peels

Pomegranate is the very known fruits to all of people however waste of pomegranate like peels are avoided for consumption but it is very much nutritious. Furthermore, it carries lots of bioactive compounds like ellagitannins, catechins, rutin, epicatechin. Due to presence of bioactive constituents, it treats mass of disorders (Mphahlele et al., 2017). Pomegranate peels have enormous polyphenol constituents which is very much essential as it is cancer mitigating compound. Due to presence of antioxidant rich components are present in this, therefore it is regarded as "Super fruit" (Ko et al., 2021). Bioactive compounds of pomegranate peels are phenolic acidsincluding gallic, caffeic, ferulic, cinnamic, ellagic acids apart from that, flavonoid compounds like catechin, epicatechin, anthocyanin, Proanthocyanidin, rutin, hesperidin etc. and also tannin like ellagitannins, Gallo tannins, corilagin, hexoside, Pedunculagin are present (Guerra-Vázquez et al., 2022). Pomegranate peels help in prevention of type II diabetes, oral cavities, Alzheimer disorder, cardiovascular manifestations, cancer and so on. Furthermore, it's bioactive constituent works as antioxidant, anti-inflammatory, antidiabetic, antimicrobial, antilipidemic agents (Derakhshan et al., 2018). In food sector, pomegranate peels are very much utilised in active packaging. From this peel, yogurt, bakery products like cookies and other food products are developed which is very much healthy (Topkaya & Isik, 2019).

1.1.2 Mango peels

Mango is defined as king of fruits. It's peels are very much healthy and have superb capacity to mitigate intricate disorders. Mango peels consist several bioactive components like essential including vitamins and minerals besides non-essential such as polyphenol, flavonoid, carotenoid, phytosterol, glucosinolates, saponin, alkaloids, essential oils. Among the family of bioactive compounds, polyphenols and carotenoids both are present in abundant quantity which have enormous functional characteristics to mitigate sickness (Rodríguez García & Raghavan,2022). Noteworthy, soluble polyphenols are involved in plant defense mechanism against pathogenic microbes on the other hand insoluble polyphenols are phenolic acids, hydroxycinnamic acids, flavonoids. Due to presence of enormous bioactive constituents, it is very much healthy to improve health status. According to literature review it is very much important that, mango peels are enriched with pectin, fibre, starch, and fat (García-Mahecha et al., 2022).

1.1.3 Orange peels

Among the family of citrus fruits, orange is the foremost sources of vitamin C. The bioactive components of orange are flavonoids including neoeriocitrin, naringenin, melitidin, brutieridin, hesperidin, naringenin and so on, limonoids, carotenoids, phenolic compounds, tocopherol, phytosterol, pectin, vitamin, minerals, β sitosterol, coumarin, limonoids, polysaccharides, phenolic compounds (Mannucci et al., 2018). Furthermore, these bioactive components have enormous biological activity like anti- microbial, antiallergic, anticancer (Castro et al., 2020), anti-epileptic, anti-anxiety, hypolipidemic (Vahidi et al., 2019), hypoglycaemic, antilipo genic, antioxidant, anti-inflammatory, antigenotoxic, anti-helminthic (Rosa et al., 2019), anti-ulcerogenic, gastroprotective, anti-cholesteric, antidiabetic, anti-inflammatory, neuroprotective activity as well as it has prominent prebiotic capacity (Chi et al., 2020).

1.1.4 Banana peels

Like other fruit peels, banana peels are very much utilising source to prevent any kind of sickness. Firstly, it is better source of insoluble dietary fibre like cellulose. With the help of cellulase enzyme, peels containing cellulose is hydrolysed and it is functioned as biocatalyst (Singh et al.,2021). Moreover, peels are used as substrate for generating the amylase and cellulase (Rana et al.,2018). This peel has much amount of flavonoid and phenolic substances. Due to present of this it has smooth texture (Alamsyah et al., 2016).

Other bioactive constituents are carotenoid, biogenic amine, phytosterols, bioactive amines like polyamines and biogenic amines are present whichis very essential to increase the storage life as well as quality of banana (Islam et al., 2016). Polyamines escalate the positivity of depression. Additionally, histamines, phenylethylamines, serotonin of banana peels can act as protecting compounds (Bajwaet al., 2015). Banana peel is the relevant origin of neurotransmitter dopamine that improve the Parkinson's disorder (Pereira & Maraschin, 2015). Dopamine, noradrenaline is permitting for enzymatic browning. This improve burns therefore it is defined as folk medicine. Recently, it has been documented that, this contains fibroblast cells mitigate the wound infection (Agudelo-Romero et al., 2013), decrease inflammation, has antibacterial property, apart from that, it upgrades the symptoms ofrenal lithiasis like calcium kidney stones, atherosclerosis, improve liver diseases, hypertension, gastro infection, anti-helminthic, used as laxatives, lesions the symptoms of constipation, celiac disorder and peptic ulcer (Karuppiah & Mustaffa, 2013).

2. Conclusion:

Utilising food waste is a major global issue in the modern world. Vegetables and fruits are the foundationof a healthy diet. Fruits complete the cycle of a nutritious diet. Fruit peels also have a lot of health benefits for people. Researchers are attempting to repurpose various food wastes to create new food products. Recent research has revealed that the peels of pomegranates, mangoes, oranges, and bananashave a significant positive impact on one's health. These waste components aid in the creation of novel, fortified food products that are rich in bioactive substances that help treat both acute and long-term illnesses.

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