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BIO EDIBLE COATING ON CUCUMBER BY USING LEMON PEEL, COCONUT MILK AND CHINA GRASS

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ABSTRACT

The bio edible films or coatings could be a remarkable growth in recent decades. it's a very important impact on the standard of food products within the coming years. This growth is to extend the knowledge of edible films or edible coating technologies and also advances within the material of science and processing technology. The film is employed to safeguard them from bacterial infections and also from spoilage of fruits and vegetables. It play a important role as an eco-friendly biodegradable coating, it can eaten with the fruit. A large amount of bio-based polymers are to be employed in the assembly of edible films and coatings. The materials that wont to make the bio edible film is China grass, coconut milk and peel.The coating on surface of vegetables have the sensation of freshness, that increases the period moreover because the product quality. This paper presents the concept and potential for the applying of bio edible film materials and management of food wastes from the fruit and vegetable in industry, which might prevented by bio edible coating. As well because the secondary metabolites present in citrus peel. It summarizes the extensive knowledge about the bio edible film like lemon rind, China grass and coconut milk to point out their protective effectiveness and suitability in cucumber.

KEYWORDS: ***bio edible coatings; shelf life; food quality, antimicrobial activity.***

1.INTRODUCTION

An bioedible coating may be a thin layer of edible material, which is created as a protective coating on fruits and vegetables.This can be consumed together with the products. The film are in liquid form, applied onto surface of cucumber. Edible films are self-standing structures in nature[1]. Various biopolymers utilized in the assembly of edible materials like ramee, coconut milk and lemon rind.These are the sources obtained from plants.The biopolymers have the capacity to regenerate the tissue and even have medical properties[2].So differing kinds of oils are incorporated into a colloid matrix to boost the barrier properties. the foremost popular are waxes, triglycerides, acetylated monoglycerides, free fatty acids, and vegetable oils [3].

Application and Benefits of bioedible Coating The uses of bioedible coatings is extended for a good range of food products including fresh and also for minimally processed fruits and vegetables. the explanations behind this is often to increase product period and quality of products.As well as control the degradative oxidation and respiration reactions, add texture and sensory characteristics and are ecofriendly[4].

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Edible coatings will be applied by dipping the products and so allowing coating to dry and solidifies.These edible materials have different barrier properties against gases, physico-chemical and mechanical characteristics then, it can protect mechanicaly likewise as prevent the contamination from microorganism and quality loss of vegetables (e.g. moisture, flavours etc.).

Importance of Edible CoatingIt may be a natural protective waxy coatings and supply a barrier to moisture, oxygen and solute movement for the food. they're applied directly on surface of cucumber by dipping, spraying or brushing to form a modified atmosphere. An bioedible coating extends the storage lifetime of fresh vegetables without causing any spoilage and reduces decaying without affecting the standard of the vegetable. Coatings usually used on citrus, apples (shellac and carnauba wax), tomatoes (mineral oil) and cucumbers (various waxes). which has proven by many beneficial effects within the context of import addition and time period extension of fresh produce[5].

Food preservation includes food processing which prevent the expansion of micro organisms.It increase the shelf-life of foods thus increasing the availability. such a large amount of foods may be preserved for an extended time.Adding variety to the diet.Saving time by reducing preparation time and energy, because the food has already been partially processed.Stabilising prices of food, as there's less scope of shortage of supply to demand. Decreasing wastage of food by preventing decaying of food(6).

Agar agar(chinagrass) may be a mixture of two components: the linear polysaccharide agarose, and a heterogeneous mixture of smaller molecules called agaropectin.It forms the structure within the cell walls of certain species of algae(red algae) and is released on boiling.Agar is employed as solid substrate to contain culture media for microbiological work. Agar is used as a laxative, an suppressant, a vegetarian substitute for gelatin, a thickener for soups, in fruit preserves, frozen dessert etc (7).

Coconut milk is an opaque, milky-white liquid extracted from the grated pulp of mature coconuts.The opacity and rich taste of coconut milk thanks to its high oil content. it's a standard food ingredient Coconut tin can even be accustomed produce milk products.These products aren't the identical as regular (8). coconut milk products which are meant for cooking, not drinking.It is utilized in many desserts and beverages (9)..

2. MATERIALS AND METHODS

2.1 Collection of Source

The chinagrass, cucumber ,coconut milk and lemon rind extract powder were collected from different regions of villages and malappuram district of Kerala. The materials were boiled in water for getting the extraction of every and skin dried for grinding. After drying, the peel material were ground well using mechanical blender into fine powder and transferred into airtight container with proper labelling for future use(10).

2.2 Qualitative Phytochemical Analysis

Standard procedures were followed for the qualitative screening of phytochemicals like amino acids, saponins, proteins, phenols, alkaloids, carbohydrates, tannins, flavonoids, phytosterols and glycosides

2.3 HPTLC Analysis

Before beginning an HPTLC experiment, we must recognize the assorted components essential to perform the method.A tool suitable for sampling as bands to watch the scale and position of the test, furthermore because the sample volume applied.An appropriate chromatographic chamber which provides developing distance and control of saturation.A device appropriate for controlling stationary phase behavior through ratio.A tool appropriate for reproducible drying of the developed plate.Appropriate equipment for reagent transfer and heating.A Tool for electronic documentation of chromatograms.

2.4 Preparation of Bioedible Film

10g of Chinagraass,10ml of coconut milk and 10ml of lemon peel extract was taken in a conical flask and heated Contineusly for dissolving the chinagrass properly with them.And stirring properly using a stick for avoiding the solidification. And apply thin layer on the vegetable in proper manner.and kept it in a room temperature for the observation(12).

2.5 Antimicrobial activity

The medium was prepared by dissolving 3.8g of commercially available nutritient Agar Medium in100ml of distilled water.The dissolved medium was autoclaved at 15lbs pressure at 121 degree celcius for 15mins. The autoclaved medium of nutrient Agar was mixed well and poured on to petriplates(20to25ml/plate) while still molton.The plates were seeded with 24 hours culture of bacterialstrains. Wells were cut and 20µl of the plant extracts (methanol extract) were added.The plates were

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then incubated at 37 degree Celsius for 24 hours.The antibacterial activity was was measured by the zone of inhibition formed around the well(13).

Cultures used for antimicrobial activity: The microorganisms used were as follows,Escherichia coli and staphylococcus aureus. Culture medium: Nutrient agar medium were used in all further studies.

RESULT AND DISCUSSION

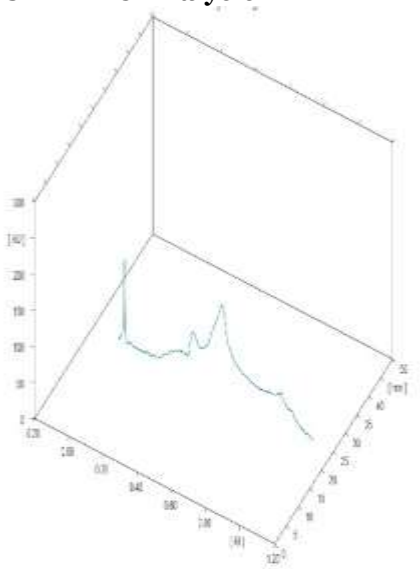
3.1 Collection of source

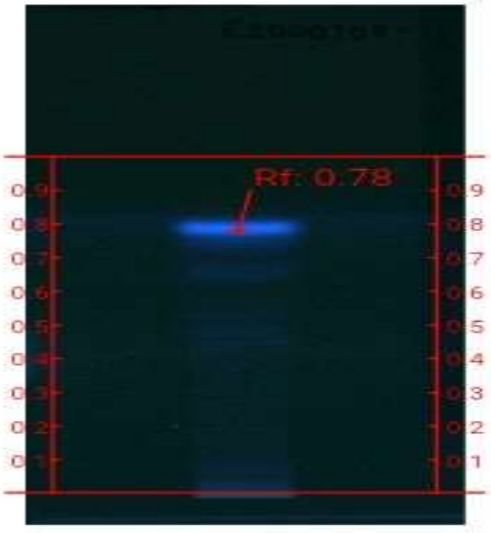
The sources were collected from local shops and their extracts were made by standard procedures.

3.2 Qualitative phytochemical analysis

Phytochemical analysis for the lemon peel extract was done which was the main ingridient that protects the actiivty of bioedible coating. It showed the presence of Flavonoids,phenols and tannins which was rich in the lemon peel extract.

3.3 HPTLC Analysis





The graph contain 8 peeks, the highest peek value shown in the figure is 200mm & lowest peek point is 50mm.ie, the sample contain rich amount of flavanoids. And the Rf value 0.78 shown above

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3.4 Preparation of lemon peel extract

3.5 Preparation of bioedible film

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3.6 Antimicrobial Activity

Antibacterial antibiotics is a type of Antimicrobial used in treatment and prevention of bacterial infections.They kill the bacteria.In the given methanol bio edible compond was done and the results are shown

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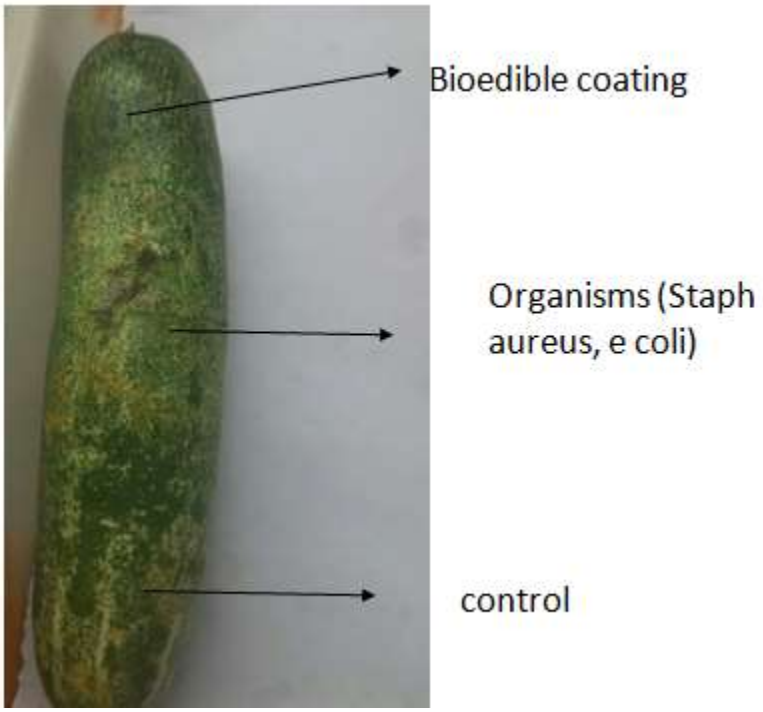
MICRO ORGANISM	ZONE OF INHIBITION
Escherichia coli	50µg - 0.8cm
	100µg -1.4 cm
	Penicillin -2.3 cm
	DMSO - 0.9cm
Staphylococcus aureus	50µg - 0.8cm
	100µg - 0.85cm
	Penicillin - 2.8cm
	DMSO - 0.8cm

3.7 Acitvity of Bio edible coating on cucumber



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RESULT:

Bioedible film coated cucumber

Day 1 Day 7 Day 15

Thus bioedible coating wasdone on cumcumber which was proved to be a good antimicrobial property thus prevented the cucumber from spoilage for 15 days.

CONCLUSION

An bioedible coatings can prevent the spoilage of fruits and vegetables and it enhances the product quality and shelf life of the product. Almost All phytochemicals are present in the citrus fruits . Because they Are Good source of antioxidant supplements that helps to our body. So the flavanoids is rich in citrus lemon peel. It's is estimated by hptlc method.

REFERENCES

1. *Hassan, B.; Chatha, S.A.S.; Hussain, A.I.; Zia, K.M.; Akhtar, N. Recent advances on polysaccharides, lipids and protein based edible films and coatings: A review. Int. J. Biol. Macromol. 2018,109, 1095–1107*
2. *Falguera, V.; Quintero, J.P.; Jiménez, A.; Muñoz, A.; Ibarz, A. Edible films and coatings: Structures, active functions and trends in their use. Trends Food Sci. Technol. 2011, 22, 291–303.*
3. *Galus, S.; Kadzi ´nska, J. Food applications of emulsion-based edible films and coatings. Trends Food Sci. Technol.2015, 45, 273–283. [CrossRef*
4. *Guilbert, S., Gontard, N., and Gorris, L.G.M. 1996. Prolongation of the shelf-life of perishable food products using biodegradable films and coatings. Lebensmittel Wissenschaft Technology, 29 (1): 10-17.*
5. *G. and Fennema, O. 1994. Edible films and coatings: characteristics, fonnation, definitions and testing methods. Edible Coatings and Films to Improve Food Quality, 1-24*
6. *Baldwin, E.A. 1994. Edible coatings for fresh fruits and vegetables: past, present and future. Journal of Food Science and Technology, 1: 25-28.*
7. *Cuppett, S. L. 1994.Edible coatings as carriers of food additives, fungicides and natural antagonists. Edible Coatings and Films to Improve Food Quality, 1: 379.*
8. *Gennadios A, Weller CL. Edible films and coatings from soymilk and soy protein. Cereal Foods world. 1991 Dec; 36(12):1004-1009.*
9. *López, O.; García, M.A.; Zaritzky, N.E. Novel sources of edible films and coatings. Stewart Postharvest Rev.2010, 3, 1–8*
10. *Pichersky, E.; Gang, D.R. Genetics and biochemistry of secondary*
11. *Rojas Graü, M.A., Tapia, M.S., Rodriguez, F.J., Carmona, A.J., Martin Belloso, O., Food Hydrocolloids, 2007. 21, 18.*
12. *Santosh Pandit, Hye Jin Kim, Jeong Eun Kim, Jae GyuJeon, Food Chem., 2011, 126, 1565.*
13. *Shivendu Ranjan, Nandita Dasgupta, Proud Saha, Madhumita Rakshit and C. Ramalingam, Adv. Appl. Sci. Res., 2012, 3 , 495.*
14. *Sundaram, S.G., Milner, J.A. Biochem. Biophys. Acta., 1996. 1315, 15.*
15. *Victor Falgueraa, Juan Pablo Quinterob, Alberto Jim enezc, Jos e Aldemar Munozband Albert Ibarza. Trends Food Sci. Technol., 2011. 22 .292.*
16. *Yara S. Queiroz , Emília Y. Ishimoto , Deborah H.M. Bastos , Geni R. Sampaio , Elizabeth A.F.S. Torres , Food Chem., 2009. 115, 371. [18]Yoshida, H., Iwata, N., Katsuzaki, H., Naganawa, R., Ishikawa, K., Fukuda,H., Fujino, T., Suzuki, A. Biosci. Biotechnol. Biochem., 1998. 62, 1014–1017.*