



PATHOGENS TOXIN-CONTAINING FOUND RE-USED FRIED COOKING OIL

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Abstract

The purpose of this study research is to identify the pathogens present in the cooking oil from the chosen region, namely Kalukhed District Akola, and to determine changes that arise in the fried cooking oil that is reused. The study's primary goal is to identify the fried cooking oil by analyzing the selection criteria. In order to ascertain the frequency of spoiling in household samples and the chosen area's reused fried frying oil. To isolate the pathogenic microorganisms that is responsible for the spoilage of reused fried cooking oil. Cooking oil practices and to keep the fried oil in storage and ways for maintaining the quality of the re-used fried oil.

Key Word: Fried reused oil, Pathogenic bacteria, Antibiotic resistance.

INTRODUCTION

Plant ingredients such as corn, soybeans, peanuts, and olives make up the cooking oil. It is employed in baking, frying, and other culinary processes. It changes heat and occasionally alters its own flavour, but it allows for higher heating temperatures than water, which makes cooking simpler and tastier. Edible oil, often known as cooking oil, is frequently used to make foods like bread dips and salad dressings that don't require heating or frying. Oils are liquid triacylglycerols.

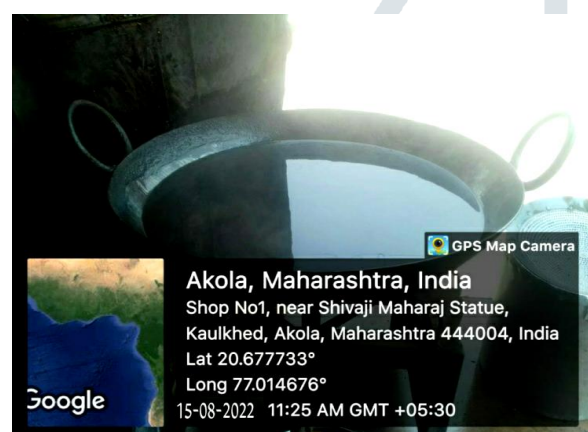
Although some oil, such as coconut oil and palm oil, contain saturated fat. Cooking oil is normally liquid at room temperature. There are a large number of cooking oils from plant sources such as olive oil, palm oil, soybean oil, canola oil, corn oil, peanut oil and other vegetable oils.

Oil can be tasted with aromatic foods containing materials such as herbs, chillies and garlic. When the cooking oil comes in contact with other components it can degrade the cooking oil easily by changing its purity and shortening its life Yazdanseta *et al.*, (2015)

The changes occur during the reheating of the oil, Deshmukh, R (2019). The reactions in oil rich frying depend on factors such as replenishment of fresh oil, frying conditions, original quality of frying oil, food materials, type of fryer, antioxidants, and oxygen concentration. Antioxidant decreases the frying oil oxidation, but the usefulness of antioxidant low with high frying heat (Wai, T. *et al.*, 2007) the physical and chemical properties of cooking oil change, the oil must be discarded because it can prove to be harmful for human beings. The rate of formation of cooking oil decomposition products depends on the type of food being fried, the type of oil used and the design of the fryer Bhagwan *et al.*, (2011) Studied on readymade food matters which contain some compounds which cannot spoilage the food materials likewise considered the impact of hydrocolloid (*HPMC*, *CMC*, *guar gum*, and *xanthan gum*) in packaging of oil fried foods on decrease of oil uptake.

METHOD AND METHODOLOGY

Multiple methods were used in this investigation to identify microorganisms. Biochemical and microbiological features, as well as the bacteria's susceptibility to and resistance to different antibiotics, are utilized to identify and isolate the germs. The analysis that came next reveals the bacterium's research.



RESULTS AND DISCUSSION

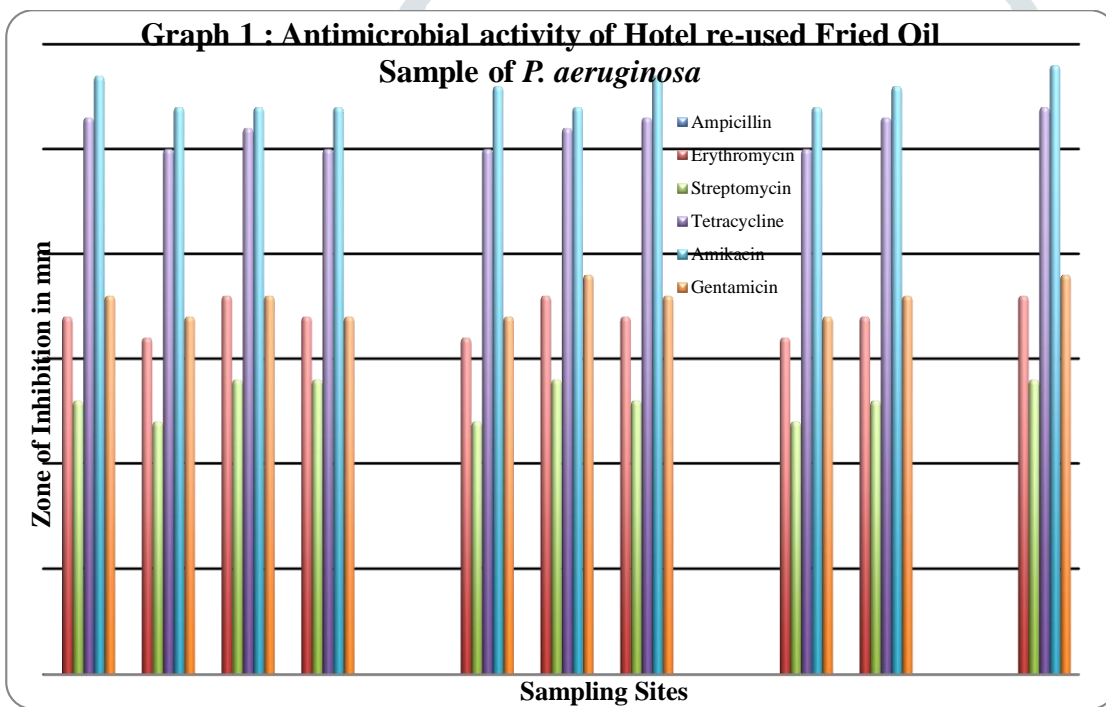
The report further demonstrates that wheat flour composites arranged by hybridization with micro articulated rice flour (up to 30%) and soybean hulls (up to 10%) displayed one of kind physical properties and were powerful in lessening fat uptake amid frying. Kim *et al.*, (2011) respectively studied on discussion for the frying the oil for a specific limit or a 10 % or 30% as per their quality can be heated additionally considered the physical properties of wheat flour composites dry-covered with micro articulated soybean hulls and rice flour and their utilization of low-fat donut readiness.

Table 1. HOME RE-USED FRIED OIL SAMPLES

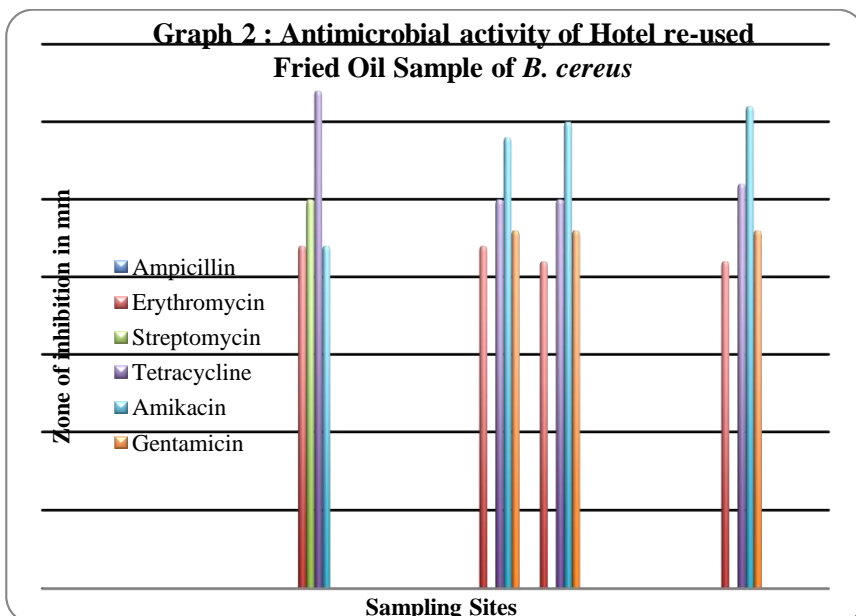
Sr. No	Place of sample Home	Sample	Type of oil	One sample used in different times	Hygienic Condition in studies area	Organism find out	Antibiotic zone of inhibition in mm	
1	Chanchal Pawsale	O	Soybean	single	Clean	-ve	-ve	-ve
2	Pushpa Kale	O	Soybean	double	Clean	-ve	-ve	-ve
3	Nanda zadokar	O	Peanut	Single	Clean	-ve	-ve	-ve
4	Archna Zadokar	O	Peanut	single	Clean	-ve	-ve	-ve
5	Kavita Kadu	O	Soybean	single	Clean	-ve	-ve	-ve

6	Sangita Bhakre	O	Soybean	single	Clean	-ve	-ve	-ve
7	Sakshi Bhakre	O	Peanut	single	Clean	-ve	-ve	-ve
8	Mira Pavsale	O	Peanut	single	Clean	-ve	-ve	-ve
9	Archana Belsare	O	Soybean	Triple <	Clean	<i>P. aeruginosa</i>	Ampicillin	-ve
				Triple <	Clean	<i>P. aeruginosa</i>	Erythromycin	17
				Triple <	Clean	<i>P. aeruginosa</i>	Streptomycin	13
				Triple <	Clean	<i>P. aeruginosa</i>	Tetracycline	26.5
				Triple <	Clean	<i>P. aeruginosa</i>	Amikacin	28.5
				Triple <	Clean	<i>P. aeruginosa</i>	Gentamicin	18

Abbreviation: O-Oil, < Greater than, *P. aeruginosa*- *Pseudomonas aeruginosa*, Not Found -ve



The graph highest zone is observed in Khetan Nagar Akola and Samata Colony Akola.



The highest zone on the graph is located in Pramod Nagar, followed by Kaulkhed Chauk, Samata colony Akola, Nage layout Akola, and others that are intermediated.

Table 2 : Biochemical characterization Carbohydrate fermentation , IMViC test and Enzymes test :

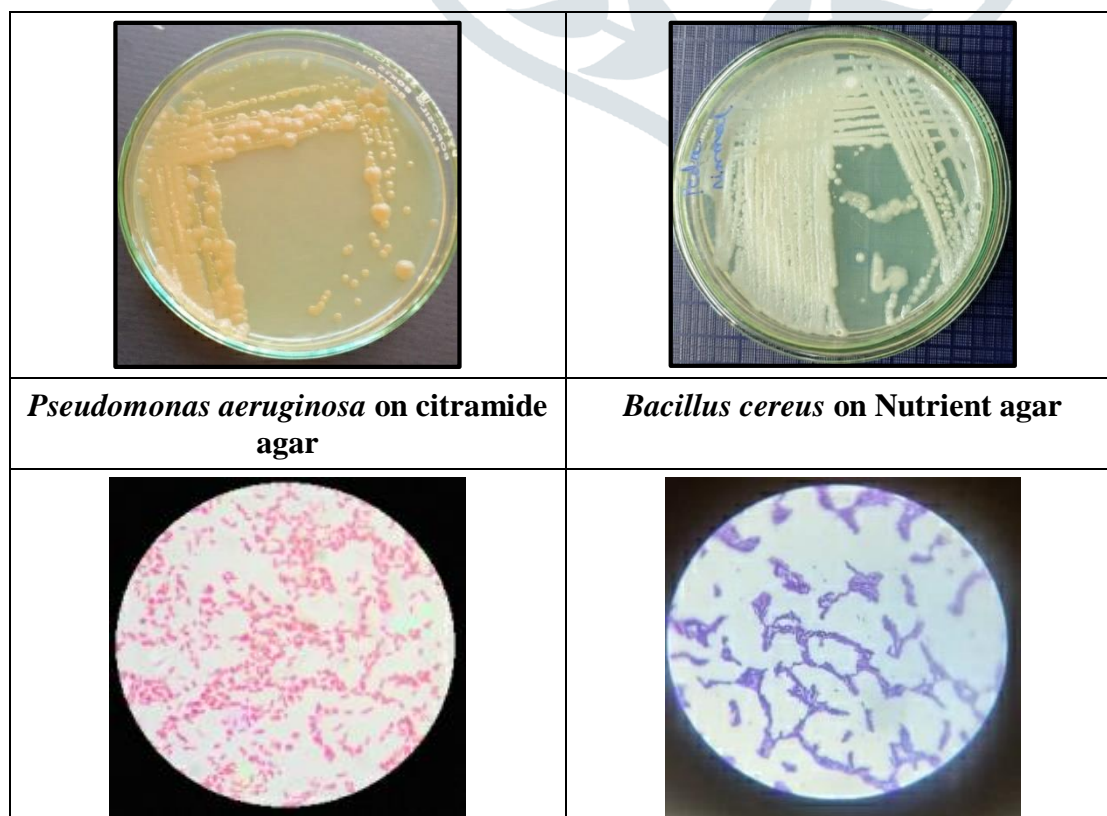
Bacteria	Glucose		Lactose		Mannitol		Indol	MR	VP	Citrate	Catalase	Oxidase	Urease	Amylase
	Acid	Gas	Acid	Gas	Acid	Gas								
<i>Bacillus cereus</i>	+ve	+ve	-ve	-ve	+ve	+ve	-ve	-ve	+ve	+ve	+ve	-ve	+ve	+ve
<i>Pseudomonas aeruginosa</i>	+ve	+ve	+ve	+ve	+ve	+ve	-ve	-ve	-ve	+ve	+ve	+ve	-ve	+ve

Table 3 : Repeated Use of Cooking Oil for Frying

Use of Cooking Oil Repeatedly for Frying	Count	%	Sample used for number of times	Count	%
No	3	23.08 %	More than 3 days	1	8 %
Yes	6	46.15 %	Next Day	5	38.7 %
Sometimes	4	30.77 %	Single used per day	4	31 %
Total	13	100 %	Use for 3 days	2	15 %
			Use until the colour becomes dark	1	8 %
			Grand Total	13	100 %

Table 4 : Samples used for number of times

Photo Plate 1. Morphological and Cultural Characteristics of Isolates




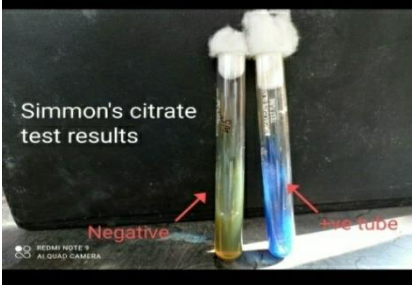

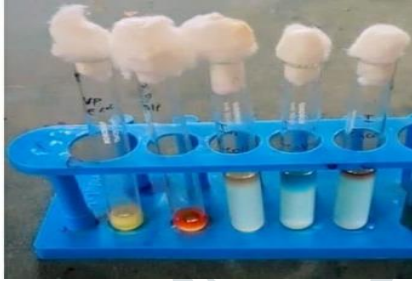
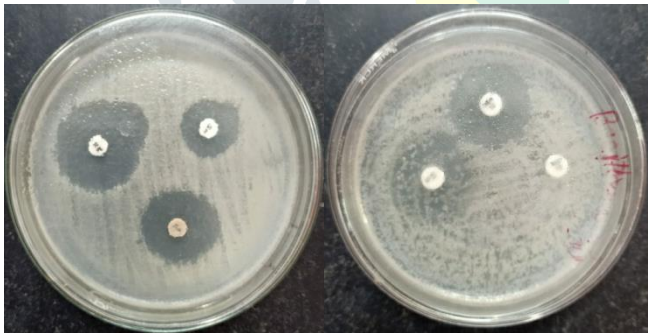
<p>Gram staining <i>Pseudomonas aeruginosa</i></p>	<p>Gram staining <i>Bacillus cereus</i></p>
	
<p><i>Pseudomonas aeruginosa</i> catalase test</p>	<p><i>P. aeruginosa</i> and <i>Bacillus cereus</i> Citrate test</p>
	
<p><i>Bacillus cereus</i> catalase test</p>	<p>Indole, MR and VP for <i>P. Aeruginosa</i> and <i>B. Cereus</i></p>

Photo Plate 5. Antimicrobial Susceptibility Test against selected organisms


<p>AST <i>Pseudomonas aeruginosa</i></p>

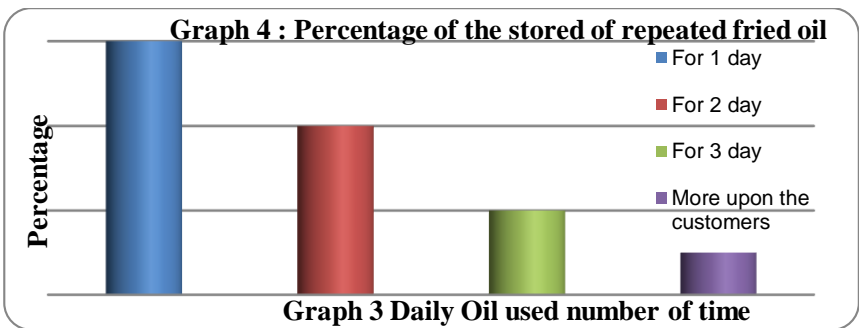
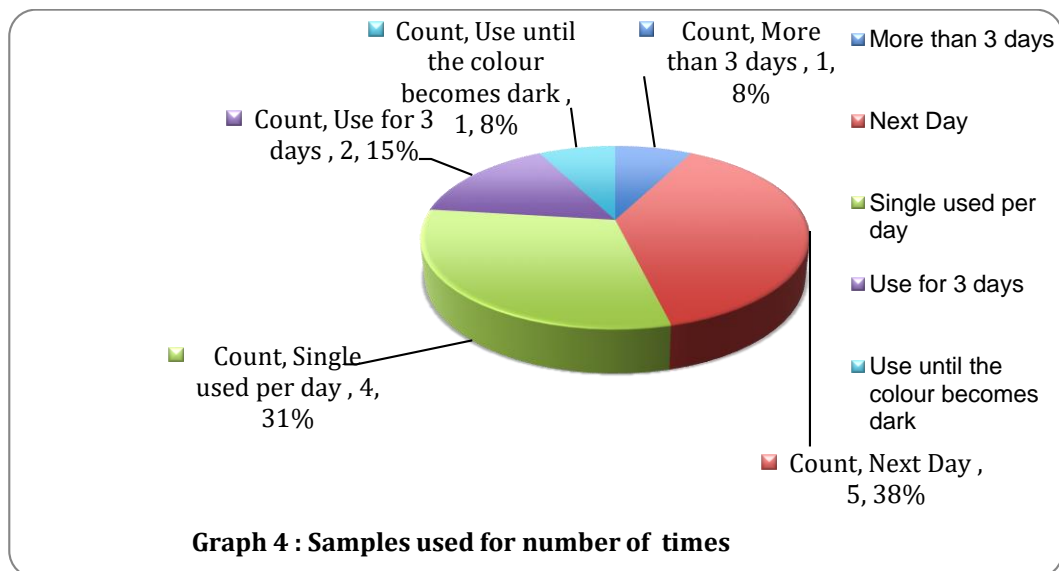


Table 6 : Percentage of the stored of repeated fried oil

Repeated fried oil is kept stored	Number of Person	%
For 1 day	6	46.16%
For 2 day	4	30.77%
For 3 day	2	15.38%
More upon the customers	1	7.69%
Total	13	100%



ANTIMICROBIAL SUSCEPTIBILITY TESTING:

In the present study *Pseudomonas aeruginosa* were highly sensitive towards Tetracycline and Amikacin and intermediate to *Erythromycin*, *Streptomycin* and *Gentamicin* and resistant to Ampicillin. *Bacillus cereus* was isolated with resistance to *Ampicillin* and *streptomycin* and highly sensitive to *Tetracycline*, *Gentamicin*, *Erythromycin* and *Amikacin*.

STORED OF REPEATED FRIED OIL

According to the above study (46.16%) of hotelman stored repeated fried oil for 1 day only. Whereas for 3 days the hotelman oil is stored (15.38%) followed by (30.77%) of hotelman kept stored for 2 days, while (7.69%) of hotelman depends upon the customers. According to Poornima *et al.*, (2019) the repeated oil stored for 1 day was (63.2%). For 2 days was (7.9%), for 3 days (21.1%) and more upon the customers was (7.9%).

Foodborne pathogenic are the most common causes of food born disease. This study therefore aimed to analyse the bacteriological profile in reuse of fried oil samples from selected areas. A total of 22 samples are selected and examined to show the growth of *Bacillus cereus* and *Pseudomonas aeruginosa*.

DISCUSSION

This oil now becomes dangerous for human consumption which causes disease like hypertension, lipid deposition, increased cholesterol level, and cancer because of the release of polycyclic aromatic hydrocarbons

(PAII) and aldehydes that linked with high risk of cancer and inflammation in the body. The diocese is also caused because of 4-hydroxy-trans-2-nominal. Lipid oxidation causes a high risk for the development The human body is constantly subjected to significant oxidative stress as a result of the imbalance between antioxidative protective systems and the formation of strong oxidizing substances, including free radicals. This stress causes proteins, lipids and carbohydrates and could cause negative effects on intracellular signal transmission. In the present study *Pseudomonas aeruginosa* were highly sensitive towards Tetracycline and Amikacin and intermediate to Erythromycin, Streptomycin and Gentamicin and resistant to Ampicillin. *Bacillus cereus* was isolated with resistance to Ampicillin and streptomycin and highly sensitive to Tetracycline, Gentamicin Erythromycin and Amikacin Therefore oil should not be heated again and again as it contains harmful products and pathogenic bacteria. At the last, the reheated cooking oil becomes waste and it is used as a biodiesel fuel carry out certain procedure (Raqeeb *et al.*, 2015)

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