Journal of Science Research and Reviews
PRINT ISSN: 1595-9074
E-ISSN: 1595-8329
DOI: https://doi.org/10.70882/josrar.2025.v2i2.66
Homepage: https://josrar.esrgngr.org
Original Research Article

Formulation and Characterization of Black Medicated Soap using Waste Agricultural Products with Blended Oils

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KEYWORDS
Agricultural wastes,
Beef tallow fat,
Black medicated soap,
Hump fat,
Palm kernel oil.

ABSTRACT
The saponification technique, which involves reacting triglyceride-containing oil/fat with caustic soda (NaOH) are used to formulate soaps. However, the fatty acid makeup of various oils varies, which accounts for the various qualities of the soaps made from them. The X-ray fluorescence examination performed on the agricultural wastes ashes revealed the existence of potassium oxide (K_2O) and sodium oxide (Na_2O) as the primary components in the ashes. The plantain peel, cocoa pod, and palm tree bunch ashes were also analyzed using a flame photometer, and the results showed that the K: Na ratio was 2:1. KOH and NaOH were combined in a 2:1 ratio to serve as the real lye utilized in the saponification of the blended oils. The sequence of PKO >HPO >BTO were determined by analyzing the oils for saponification number (SN), iodine value (IV), unsaponifiable matter (UM), and acid value (AV). Nine distinct soap samples were formulated by blending three different oils in varying ratios. The combination of 150 cm^3 of palm kernel oil, 90 cm^3 of hump oil, and 60 cm^3 of beef tallow oil was shown to be the best formulation. This oil blend was discovered to have an iodine number of 77.96±0.72 and a saponification number of 249.57±0.78, both of which are greater than the individual values. As a result, soap made with a combination of these oils has superior qualities than soap made from individual oils. Based on SON indices for evaluating soap quality, the evaluation of the formulated soaps revealed that the soap's quality was in the following order: soap made from plantain peel extract was superior to soap made from cocoa pod extract, and soap made from cocoa pod extract was superior to soap made from palm tree bunch extract. Given that both the control and soap solution's, antimicrobial activity rises with concentration, the antimicrobial screening results of the soaps were largely good. Agricultural waste of plantain peel, cocoa pod, and palm tree bunch ashes, can be used to make good, biodegradable, and ecologically friendly organic soaps. For the first time in the history of soap technology globally, hump fat blend was used to formulate excellent organic medicated soap.

CITATION
Uduma, U. A., Jacob, G. A., Hussaini, A., Suleiman, S., & Uduma, M. B. (2025). Formulation and Characterization of Black Medicated Soap using Waste Agricultural Products with Blended Oils. *Journal of Science Research and Reviews*, *2*(2), 53-62. https://doi.org/10.70882/josrar.2025.v2i2.66

INTRODUCTION

The process of reacting vegetable oils or animal fats with potassium and /or sodium hydroxide yields soap, a cleaning or emulsifying agent. The process of "saponification" involves hydrolyzing triglycerides with a base (often NaOH or KOH) to produce three salts (soap) and glycerol. A lengthy hydrocarbon chain with a carboxylic acid group at one end that forms an ionic bond with a metal ion—typically potassium or sodium—defines a soap molecule (Onyegbado et al., 2002). The ionic end is soluble in water, but the hydrocarbon end is non- polar and very soluble in non-polar substances (Aremu *et al.,* 2015). Below is a representation of the soap molecule's structure:

$$CH_3\text{-}CH_2\text{-}CH_2\text{-}\ CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}\ CH_2\text{-}CH_2\text{-}\ CH_2\text{-}CH_2\text{-}\ CH_2\text{-}CH_2\text{-}\ CH_2\text{-}CH_2\text{-}\ \overset{\overset{\displaystyle O}{||}}{C}\text{-}O^-\ Na^+$$

Non-polar hydrocarbon chain (soluble in nonpolar substances) — ionic end (soluble in water)

The cleaning action of soaps are because of their ability to emulsify or disperse water- insoluble materials and hold them in the suspension of water. This ability is seen from the molecular structure of soaps. When soap is added to water that contains oil or other water-insoluble materials, the soap or detergent molecules surround the oil droplets. While the ionic end enables the oil to dissolve in water, the oil is dissolved in the alkyl groups of the soap molecules. Therefore, the oil droplets can be rinsed away after being distributed throughout the water. The method of manufacturing soap and the final product's quality are influenced by several factors (AOAC, 2000). The qualities of the oil used to produce this soap, as well as the proportions of water and caustic soda, determine its properties. The amount of free fatty acids in the oil, the temperature of the ingredients before mixing, and the intensity of the mixing all affect how quickly the oil and caustic soda react. (Aiwizea and Achebob, 2012).

When a decent soap doesn't contain chemicals that can't be broken down by its natural ingredients, it is biodegradable. In general, an oil blend works well for making high-quality, reasonably priced, multipurpose soaps that are firm to the touch, have a strong cleaning action, and produce a great lather in both soft and hard water. Because they don't include synthetic ingredients, organic soaps made from agricultural waste are environmentally friendly and biodegradable. This study demonstrates one method of turning garbage into money and employment opportunities. Therefore, it is convenient to use agricultural waste products with blended oils to create and describe the black medicated soap.

Blending multiple oils of varied qualities and prices for soap making could go a long way in the production of quality soaps for washing, bathing and general cleaning applications. Blended oils provide excellent saponification values and invariably high grade soaps (Aremu et al., 2015). The use of agricultural wastes in soap making reduce environmental degradation, create wealth and job opportunities and increases the strength of our local currency, the Naira. Given that the majority of multinational corporations are now departing Nigeria as a result of the economic crisis, the research's most significant influence on students is the pressing and compelling necessity to cultivate industrial entrepreneurship abilities and talents. Local manufacturing industries are needed to close the vacuum and prevent the gap generated by these exits.

However, the manufacturing of soap from natural ingredients in place of synthetic chemicals is gaining prominence in recent decades. Because they moisturize human skin and heal skin-related diseases, agricultural by-products (wastes) are regarded as sources of organic materials in the production of soap (Alharbi et al., 2021; and Ogunbiyi and Eneckwu, 2023). According to Rambabu and colleagues, organic compounds derived from agricultural waste have demonstrated antibacterial action against Pseudomonas aeruginosa and Streptococcus pyogenes (Onyegbado et al., 2002; Rambabu et al., 2020).

Furthermore, because of the significant class of phytochemicals (alkaloids, flavonoids, terpenoids, phenols, etc.) and essential mineral components (calcium, copper, potassium, phosphorus, zinc, etc.), agro-waste materials, such as plantain peels, have been regarded as a viable source of (alkaloids, flavonoids, terpenoids, phenols, etc.) as kaline for saponification reactions (Sani and Muhammed, 2021). Additionally, oils made from agricultural materials, such as coconut and palm oils, contain alkaloids, terpenoids, saponins, and saponifiable free fatty acids (Ankrah, 1974; Afrane, 1992; Taiwo and Osinowo, 2001; Bassey et al., 2019; Tacin et al., 2019; Ajongbolo, 2020).

Soaps are typically fatty acid salts that can be firm or soft depending on the components utilize ed. They are made from fats/oils that have been hydrolyzed with an alkaline to produce fatty acid salts (soap) and glycerol (by- product) (Figure 1) (Olabanji et al., 2012; Adebomi et al., 2017). Negative ions comprising long hydrocarbon chains connected to a carboxyl long hydrocarbon chains connected to a carboxyl group are common in the soaps that are being produced, giving it a cleansing action when used for bathing, washing, or general cleaning (AOAC, 2000;Adeyinka et al., 2014)Therefore, this paper examines the production of black medicated soap, using plantain peel, cocoa pod, palm tree bunch, palm kernel oil, beef tallow fat and hump fat and physicochemical analysis of the soap produced were also evaluated.

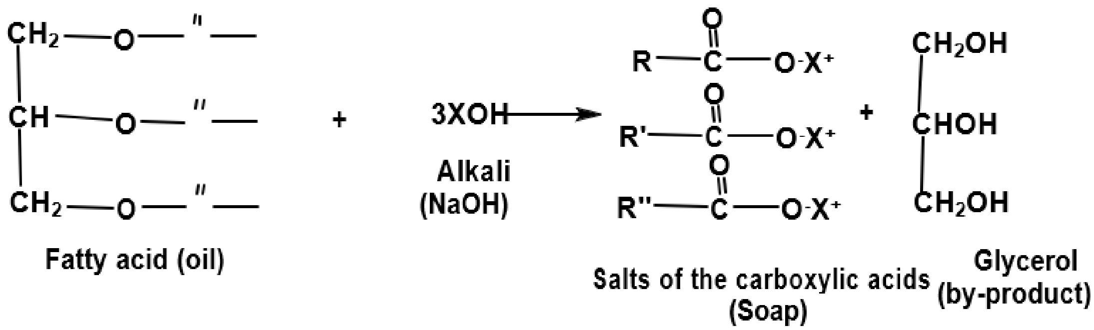

Figure 1: Saponification reaction of a triglyceride and alkaline to produce soap

MATERIALS AND METHODS

Sample Collection and Treatment

The plantain peel, cocoa pod and palm tree bunch were collected from Katsina Central Market, Katsina State, Okiti Pupa cocoa plantation, Ondo State and Oturukpo Palm tree plantation, Benue State of Nigeria. The Samples were kept in the laboratory for two weeks to dry, then oven dried at 40 ^{0}C to a constants weight, after which they were burned into ashes using muffle furnace at 550°C for 5 h. (Adaku and Melody, 2013).

The palm kernel oil (PKO) used in this study was bought in Galadima market near Yankura in Fagge LGA, Kano State. The beef tallow and hump fat were bought from the Kano central abattoir in Fagge LGA, Kano State. They were washed with tap water, dried and boiled in a dried clean pot until the fats were turned into oil. The oil was allowed to cool and filtered into plastic containers. The various blending ratios of the oils (Table 5) were used for the saponification.

Method of Extracting Alkaline from Plantain Peel, Cocoa Pod and Palm Tree Bunch Ashes

208g of Plantain peel ash, 696g of cocoa pod ash and 1092g of palm tree bunch ash were measured individually into four liter beaker and made up with deionized water. The set up were allowed for one week with daily stirring once every day. Finally, the extract was sieved into cleaned receiving beakers. Water was then added, and the set up was allowed to stand until the filtrates dried out. Addition of water continues until the volume of filtrate was up to 4 liters. The filtrate was then concentrated in a cleaned cooking pot, to about one – quarter of its original volume. The amount of lye in the one liter was calculated titrimetrically and the corresponding amount of the blended oils were used for the saponification process. Heating process was stopped and the soap was allowed to cool into a solid mold (Adaku and Melody, 2013). After the plantain peel ash, cocoa pod ash and palm tree bunch ash were burned their ashes contained potassium oxide K_2O and Na_2O, as revealed by XRFs analysis conducted on the ashes. When the K_2O and Na_2O were mixed with water, the strong base potassium hydroxide (KOH) and sodium hydroxide (NaOH) were formed.

$$K_2O + H_2O \rightarrow 2KOH.$$

$$Na_2O + H_2O \rightarrow 2NaOH.$$

Equation for the Reactions

The materials/reagents used in this work were; palm kernel oil (PKO), hump oil (HPO), beef tallow oil (BTO), plantain peel, cocoa pod and palm tree bunch which were sourced within Nigeria.

Ethanol, ether, KOH, NaOH, anhydrous Na_2SO_4, iodine monochloride, glacial acetic acid, CCl_4, HCl, KI, Sodium thiosulphate, phenolphthalene were all obtained from BDH chemicals England. Distilled water was used throughout the period of the experiment.

In the analysis of Oil blends, standard methods were used to determine the Saponification number, Iodine value and Acid Value (Zauro et al., 2016).

Standard methods were used to analyze the following Soap properties Foam stability and Hardness of soap, Moisture content, Determination of Yield, Alkalinity, cleaning Power and Hardness (Zauro et al., 2016; Uduma et al., 2023).

Table 1: Chemical composition of ashes of plantain peel, cocoa pod and palm tree bunch (wt%)

Oxide	Chemical formula	Plantain peel	Cocoa pod	Palm bunch
Potassium oxide	K_2O	52.93	43.85	16.48
Aluminum oxide	Al_2O_3	1.67	2.19	6.73
Magnesium oxide	MgO	1.74	4.75	6.61
Calcium oxide	CaO	1.47	3.23	3.46
Zinc oxide	ZnO	0.03	0.07	0.14
Sodium oxide	Na_2O	26.47	26.93	8.24
Others	-	42.16	45.91	66.58

Table 2: Flame Photometer Analysis of Ashes for K and Na

S/N	STD	Reading	Sample ID	K (ppm)
1	10	0.59	PP	2.53
2	8	0.56	CP	2.49
3	6	0.53	PB	2.27
4	4	0.50		
				Na (ppm)
1	10	0.45	PP	1.59
2	8	0.40	CP	1.48
3	6	0.38	PB	1.36
4	4	0.32		

Identification Key: PP= plantain peel, CP=cocoa pod peel and PB= palm tree bunch.

Flame Photometer Analysis of Ashes for K and Na

The result of flame photometer analysis of ashes for K and Na is consistent with XRFs result of similar ashes and it is in the ratio of 2:1 (K: Na). The actual lye used in the saponification of the blended oils is not only KOH but a combination of KOH and NaOH, and in the ratio of 2:1 KOH/NaOH. The formulation of the soaps with a combination of KOH and NaOH, accounted for the moderate stability of the soaps (Wiyantoko *et al*., 2021).

Table 3: pH Values of Extract and Soap

S/N	Sample	Extract	Soap
1	PP(A^{O}C)	10.7	6.8
2	PP(50^{O}C	10.7	6.6
3	PP(100^{O}C)	10.6	6.7
4	CP(A^{O}C)	10.8	6.5
5	CP(50^{O}C)	10.5	6.7
6	CP(100^{O}C)	10.1	6.8
7	PB(A^{O}C)	11.1	6.6
8	PB(50^{O}C)	10.9	6.5
9	PB(100^{O}C)	11.1	6.7

Identification Key: PP= plantain peel, CP=cocoa pod peel and PB= palm tree bunch.*pH Values of Extract and Soap*

The pH of the extracts as determined using Hanna pH meter, remain alkaline and the pH of the soap produced were approximately neutral. This shows that the saponification process was complete and K/Na salts were formed. Evaluation of pH is imperative because it determines chemical reactivity of most medium (Uduma *et al.*, 2023; Aremu *et al.,* 2015).

Table 4: Mass of Ashes and KOH/NaOH

S/N	Samples	Ashes (g)	KOH/NaOH (G)
1	PP(A^{O}C)	208	141.97 : 70.98
2	PP(50^{O}C)	208	121.25 : 60.63
3	PP(100^{O}C)	208	111.9 : 55.95
4	CP(A^{O}C)	696	116.98 : 58.44
5	CP(50^{O}C)	696	121.27 : 60.63
6	CP(100^{O}C)	696	122.05 : 61.03

7	PB(A^{O}C)	1092	50.77 : 25.39
8	PB(50^{O}C)	1092	51.36 : 25.68
9	PB(100^{O}C)	1092	54.96 : 27.48

Identification Key: PP= plantain peel, CP=cocoa pod peel and PB= palm tree bunch*ass of Ashes and KOH/NaOH*

For the same quantity of ashes for plantain peel, increase in temperature decreases marginally KOH/NaOH yield but increases the yield of KOH/NaOH for both cocoa pod ash and palm tree bunch. This could be as a result of intermolecular forces between the ash particules.

Table 5: Ratio of the Blended Oils

S/N	Sample	PKO	HPO	BTO	Total volume(cm^3)
1	A^{O}C	150	90	60	300
2	50^{O}C	120	100	80	300
3	100^{O}C	110	100	90	300

Identification Key: PKO= palm kernel oil, HPO=hump oil and BTO= beeftalow oil.

Ratio of the Blended Oils

The quality of the formulated soap was in the order of PKO150:HPO90:BTO60 > PKO120:HPO100:BTO80 > PKO110:HPO100:BTO90. Researches have shown that increase in saponification number increases soap quality and because PKO has the highest saponification value, increase in 5he volume of PKO will directly increase the soap quality and vice versa (Aremu *et al.,* 2015).

Table 6: Analysis of the Blended Oils

S/N	Sample	SN	IV	UM	AV	SN of Blend
1	PKO	245.33±0.57	11.7±0.1	0.633±0.05	203.33±0.57	249.57±0,7
		7		7	7	8
2	HPO	205.66±0.57	33.33±0.577	1.7±0.1	201±1.0	
		7				
3	BTO	198±1.00	32.666±0.15	1.3±0.100	195.33±0.57	
			2		7	

Identification Key: PP= plantain peel, CP=cocoa pod peel and PB= palm tree bunch, SN= saponification number, IV= iodine value, UM= unsaponifiable matter, and AV= acid value

Analysis of the Blended Oils

Table 6 showed that the increasing order of saponification number (SN), iodine value (IV), unsaponifiable matter (UM) and acid value (AV) were PKO >HPO >BTO. The implication of this analysis is that blends of oils with high PKO when saponified with lye from plantain peel extract produces the best soap quality (Aremu *et al.,* 2015).

Table 7: Analysis of the formulated soap

S/N	Sample	TFM	AI	FA	pH	M&V
1	PP(A^{O}C)	71.666±0.577	4.066±0.0577	0.066±0.0057	6.533±0.057	5.666±0.577
2	PP(50^{O}C)	72.666±0.577	4.1±0.1	0.09±0.01	6.666±0.057	5.333±0.577
3	PP(100^{O}C)	73.333±0.577	4.533±0.0577	0.0933±0.0057	6.633±0.0577	5.666±0.577
4	CP(A^{O}C)	69.333±0.577	3.833±0.0577	0.086±0.00577	6.667±0.0577	4.333±0.577
5	CP(50^{O}C)	67.667±0.577	3.667±0.0577	0.097±0.00577	6.567±0.0577	5.333±0.577
6	CP(100^{O}C)	66.333±0.577	3.633±0.0577	0.093±0.00577	6.733±0.0577	4.333±0.577
7	PB(A^{O}C)	65.667±0.577	3.433±0.0577	0.093±0.00577	6.533±0.0577	3.666±0.577
8	PB(50^{O}C)	64.667±0.577	3.433±0.0577	0.093±0.00577	6.466±0.0577	3.333±0.577
9	PB(100^{O}C)	63.667±0.577	3.367±0.0577	0.097±0.00577	6.767±0.0577	3.167±0.289

Identification Key: PP= plantain peel, CP=cocoa pod peel and PB= palm tree bunch, TFM=Total Fatty Matter, AI=Alkaline Insoluble, FA= Free Alkaline, pH = potential hydrogen M&V=Moisture & Volatile Matter

Analysis of the formulated soap

Table 8, showed the result of the analytical assessment of the formulated soaps on the bases of SON recommended values (Table 8). The result is consistent with the previous findings, that the quality of the soap was in the order of: soaps made from plantain peel extract was better than soap made from cocoa pod extract, and soap made from cocoa pod extract was better than soap made from palm tree bunch extract in terms of TFM, AI, FA, pH, and M&V, as SON indices for assessing soap quality (Uduma *et al.*, 2023; Aremu *et al.,* 2015)

Table 8: Standard Organization of Nigeria (Son) Requirements for Medicated Soap (Copied)

Characteristics	Requirements
Total Fatty Matter (TFM) (%)	70.0 to 76.0
Moisture & Volatile Matter (M&V) max. (%)	5.0
Free Alkaline (FA) (%) max.	0.05
Alcoholic Insoluble Matter (AI) (%)	3.0

Table 8 shows the recommended values of medicated soap parameters as prescribed by SON.

Table 9: Soap Analysis Data

S/N	Sample	Lathering	Cleansing	Hardness
1	PP(AOC)	Good	Good	NVH
2	PP(50OC)	Good	Good	NVH
3	PP(100OC)	Good	Good	NVH
4	CP(AOC)	Good	Good	NVH
5	CP(50OC)	Good	Good	NVH
6	CP(100OC)	Good	Good	NVH
7	PB(AOC)	Good	Good	NVH
8	PB(50OC)	Good	Good	NVH
9	PB(100OC)	Good	Good	NVH

Identification Key: PP= plantain peel, CP=cocoa pod peel and PB= palm tree bunch.

Soap Analysis Data

In Table 9, all the soaps formulated irrespective of the source of the extracted lye had good lathering and cleansing power. However, the hardness of the soaps was not very hard. Researches have shown that soaps made from lye of KOH are generally soft. In this study, it has been established from the XRFs and flame photometer studies that the lye extracts from the agricultural wastes were generally in the ratio of 2KOH: 1NaOH, irrespective of the source of the extract. The high ratio of KOH over NaOH, could be responsible for the not- very hard properties of the soaps (Uduma et al., 2023; Aremu *et al.,* 2015).

Table 10: Antibacterial Activity of Soaps against *S.Aureus*

Samples ID	500 mg/ml	250 mg/ml	125 m±g/ml	62.5 mg/ml
Control	30.33+0.94	25.67+0.94	26.67+0.47	22.0+2.16
Ketocomazole	20mg/ml	10.5mg/ml	2.5mg/ml	
PPA	15.33333333	8,666666667	0	0
	0.942809042	0.47140452	0	0
PP50				
	18	9.3333333	0	0
PP100	0.816496581	0.94280904	0	0
	19.66666667	13.3333333	8.66666667	2.333333333
CPA	10.33333333	8	0	0
	0.942809042	0	0	0
	16	8.33333333	0	0
CP50	0	1.24721913	0	0
	0.471404521	0.47140452	0	0
	9.666666667	7.66666667	0	0
CP100	0.471404521	0.47140452	0	0
	0	0	0	0

PB50	0	0	0	0
	11.33333333	8.33333333	0	0
PB100	1.247219129	0.94280904	0	0

The results showed the antimicrobial activity of the different soaps which were labelled as (PPA, PP50, PP100, CPA, CP50, CP100,50, PBA, PB50, PB100) with varying degrees of activities which were shown in (Table 4.10, 4.11, 4.12 and 4.13).The antibacterial activity of soaps against S.aureus ranged from 8.66±0.47 mm to 15.33±0.mm, 9.33±0.94-18.0±0.81 mm, 2.33±3.29 mm-8.7±0.47 mm, 13.33±0.47 mm-19.66±0.47 mm, 8.0±0.94-10.33±0.94 mm, 16.33±0.12 7.66 ±0.47 mm -9.66±0.47mm, 8.33±0.94 mm -11, 33±1.25, respectively presented in (Table 10); (Gajic *et al.,* 2022).

Table 11: Antibacterial Activity of Soaps against *S. Epidermidis*

Samples ID	500 mg/ml	250 mg/ml	125 mg/ml	62.5 mg/ml
Control Ciprofloxacin	30.33+0.94	25.67+0.94	26.67+0.47	22.0+2.16
PPA	8.666666667	0	0	0
PP50	0.942809042	0	0	0
	15	8.666666667	7.666666667	0
	1.414213562	0.47140452	0.94280904	0
	17.33333333	8	0	0
PP100				
	0	0	0	0
CPA	0	0	0	0
CP50	13,666666667	7.666666667	0	0
	0.471404521	0.47140452	0	0
	13.666666667	9.33333333	8	8
CP100	0.942809042	0.47140452	0	0
	0	0	0	0
PBA	0	0	0	0
	0	0	0	0
PB150	0	0	0	0
	0	0	0	0
PB100	0	0	0	0

Antibacterial Activity of Soaps against *S.Epidermidis*

The antibacterial activity of soaps against *Staphylococcus epidermidis* showed activity within PPA, PP50, PP100, to CP50, CP100, with ranged of 8.66±0.94 mm to 7.66±0.94 mm, 8.7±0.47-15.0±1.41 mm, 8.14±0.14 mm-13.7±0.47 mm, 17.33±0.94 mm-7.7±0.47, 13.66±0.47mm, 8.00±0.0 - 9.33±0.47-13.66±0.47 mm from 500 mg/ml to 62.5 mg/ml respectively presented in (Table 11) (Gajic *et al.,* 2022).

Table12: Antibacterial Activity of Soaps against *C.Albicans*

SAMPLES ID	500 mg/ml	250 mg/ml	125 mg/ml	62.5 mg/ml
Control Ketocomazole	30.33+0.94	25.67+0.94	26.67+0.47	22.0+2.16
	21.6666667	10.3333333	0	0
PPA	0.471404521	0.471404521	0	0
PP50	24.6666667	20.6666667	0	0
	0.471404521	0.471404521	0	0
PP100	25.66666667	13.33333333	8.333333333	7
	0.471404521	0.942809042	0.471404521	0
CPA	11.666666667	7.666666667	0	0
CPA50	0.242809049	0.471280041	0	0
CP100	18	10.66666667	7.66666667	0
	1.414213562	0.471404521	0.471404521	0

PBA	11.33333333	7.33333333	0	0
	0.471404521	0.471404521	0	0
PB50	12	8.333333333	8	0
	1.414213562	0.94809042	0	0
PB100	13.66666667	9	0	0
	0.471404521	0	0	0

Antibacterial Activity of Soaps against *C.Albicans*

The antifungal activity of soaps against *Candida albicans* showed activity with ranges of 10.33±0.47 mm, 21.7±0.47 mm, 20.66±0.47-24.66±0.47 mm,8.33±0.94 mm-25.66±0.47 mm,
7.67±0.47 mm-11.33±1,25 mm, 7.66 .±0.94 mm - 15.66±0.94 mm,8.0±0.0mm-7.66±0.47 mm, ±0.94 mm-7.66±0.47 mm,10.67±0.47 mm-18.0 ±1.41 mm and 7.33±0.47 mm- 11.33±0.47, 8.33±0.97 -12.0±1.41, 9.0±0.0-13.67±0.47 obtained from PPA, PP50, PP100, CPA, CP50, CP100, PBA, PB50 and PB100 in 500 mg/ml to 62.5 mg/ml of the soaps concentrations respectively presented in (Table 12) (Gajic *et al.*, 2022).

CONCLUSION

Soaps were prepared using various blends of oils and lye extracted from plantain peel ash, cocoa pod ash and palm tree bunch ash. In each of these agricultural wastes, the ratio of KOH and NaOH was 2:1. The order of increment of KOH/NaOH ratio was plantain peel ash > cocoa pod ash > palm tree bunch ash. One soap making oil in itself does not have all the properties needed in soap making. Therefore blends of oils are prepared taking 3 oils together because it would produce good quality soaps. All necessary properties like Lathering power, cleansing power, pH, Hardness, Total Fatty Matter, Moisture, Yield were all studied to select the best blend out of all the blends. The combination of 150 cm^3 of palm kernel oil, 90 cm^3 of hump oil, and 60 cm^3 of beef tallow oil was shown to be the best. This oil blend was discovered to have an iodine number of 77.96±0.72 and a saponification number of 249.57±0.78, both of which are greater than the individual values. As a result, soap made with a combination of these oils has superior qualities than soap made with individual oils. Both high saponification number and iodine number indicates this blend to be highly preferred for soap making. The acid value found, that is 1.3, was also acceptable according to the literature. The unsaponifiable matter is also within the limits and oil blend can be used without being refined. The soap produced was good, eco-friendly, biodegradable and the antimicrobial screening results of the soaps were largely good. *For the first time in the history of soap technology globally, hump fat blend was used to formulate excellent organic medicated soap.* Similar studies should be conducted using other blends of oils and different agricultural wastes such as cotton stem. Sugar cane bagasse, corn stalk, maize stalk, etcetera

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