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Research Article

The Exploratory Use of *Parkia biglobosa* Seed Oil for Solvent-Based Coating

[*a]Madaki Bello, [b]Nuhu Buhari Lenfa, [c]Abdulrasheed Abubakar, [d]Aliyu Mohammed Sakpe, [e]Waira Luka Tijwun and [f]Tijwun Tweinpu Luka

[a]Faculty of Science, Department of Chemistry, Federal University Gashua, Nigeria
[b]Chemistry Department, Modibbo Adama University, Yola, Nigeria
[c,e&f]Department of Basic and Applied Sciences, College of Agriculture, Science and Technology Jalingo, Nigeria
[d]Department of Basic Sciences, Niger State College of Agriculture, Mokwa, Nigeria
*Corresponding Author Email: madakibello.mb@gmail.com

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Abstract
The research study utilised modified *Parkia biglobosa* seed oil-alkyd resin (PBSOM) for the production of solvent-based paint. The *Parkia biglobosa* seed was prepared and extraction was subsequently carried out on the prepared seed using Soxhlet extractor. The physiochemical properties such as yield, density, peroxide and iodine value of the extracted oil were in conformity with other literature. The *Parkia biglobosa* seed oil was subjected to alcoholysis process while calcium oxide was used as a catalyst. The 50% of the processed *Parkia biglobosa* seed oil was blended with 50% of the conventional alkyd resin to form novel PBSOM resin. The FTIR of the PBSOM was in conform with conventional alkyd resin. The synthesized PBSOM resin exhibits good resistance to chemical interaction. The solvent-based paint produced from PBSON resin also exercise good properties and in conformity with the standard. Hence, the PBSOM resin could replace conventional alkyd resin, thereby reduce cost of production and contribute to the industrial suitability.
Keywords: Paint, Seed Oil, Modification, Resin, Solvent.

Introduction

The quest to annex a renewable source of raw materials and to address the ever-increasing pollution in the society necessitates research into plant materials (Gidigbi *et al..,* 2019), especially those discarded as waste, to leverage on its numerous nutritional and possibly industrial application such as paint formulation. Painting and coatings are unique human activities that have helped the human race to contribute significantly in earning a better livelihood, building a better and more beautified world (Akinterinwa *et al.,* 2015). Paint is any liquid, liquefiable, or mastic composition that after application to a substrate in a thin layer, converts to a solid film. It is most commonly used to protect, colour, or provide texture to objects. Typically, solvent-based paint is usually preferred due to its good properties of flexibility, shines and high moisture resistance, and binder is one of the most important ingredients in paint formulation, because it is a film-forming substance in paint (Kumar *et al.,* 2024).

Alkyd resin is the binder for solvent-based paint. The preparation of alkyd resins is carried out by condensation polymerization of polyhydric alcohol (e.g. glycerol) and poly functional acid or polybasic acids (e.g. phthalic anhydride and isophthalic acid) modified by fatty acid or their triglyceride. The alkyd resins produced this way are referred to as oil-modified alkyd resins and contribute about 70% to the conventional binders used in surface coating (Ifijen *et al*, 2022). They determine the performance quality of surface coatings such as the rate of drying, gloss, durability of the dry film and resistance of the dry film to abrasion and chemicals. However, classification of alkyd resins is based on the oil length and oil type (Chiplunkar and Pratap, 2016). The vegetable oils used in oil-modified alkyd resins are usually extracted either by mechanical press or solvent extraction (Kumar *et al.,* 2024). The natural oil in the oil-modified alkyds reacts with atmospheric oxygen leading to the formation of network of polymers cross-linked through the C = C bond. The oxidative drying of the oil brings about the formation of film that's how improved properties with drying time, hardness or water resistance (Li *et al.,* 2023).

There has been tremendous increase in the demand for alkyd resin production due to the rapid growth of the economy (Hassanpour, 2021). Consequently, large quantities of oil are needed for the production of alkyds. Hence, there is need to investigate indigenous oilseeds in order to find other sources of drying oils with comparable properties to those currently being imported for resin production for paint, therefore, Locust bean seed oil is used to synthesized alkyd resin.

Materials and Methods

Preparation of Sample

The Locust bean (*Parkia biglobosa*) sample was collected randomly within the vicinity of Mutum Biyu in Gassol Local Government Area of Taraba State. The preparation of the seeds was done using the method described by Liu *et al.*, (2023).

Extraction of Locust Beans (*Parkia biglobosa*) Seed Oil

Vegetable oils are normally extracted from seeds and nuts using either solvent extraction as described by (Babanyaya *et al.,* 2024).

Characterization of the *Parkia biglobosa* Seed Oil

The following physicochemical parameters were carried out on the extracted *Parkia bigloboa* oil.

Determination of Density, Refractive Index and Iodine Value

Density was determined by AOAC (2022) method. Equal volume of oil sample was weighed for six trials and the weights obtained using analytical weighing balance, and density was calculated. The refractive index was carried out as outlined by Hieda *et al.,* (2022) using Abbe refractometer at a temperature of 30 °C. The iodine value of oil is defined as the number of grams of iodine which can be absorbed by 100 g of the oil. It is the measure of proportion of unsaturated acids present in the oil (Hieda *et al.,* 2022). The standard procedure outlined in Hieda *et al.,* (2022) was followed.

Determination of Peroxide Value, Saponification Value

The peroxide value signifies the deterioration of oils as a result of oxidation of unsaturated fatty acid, when the oil is exposed to oxygen while saponification value refers to number of milligrams of potassium hydroxide required to neutralize the acids resulting from the complete hydrolysis of 1 g of an oil or fat. Both are carried out according to the method described by Dagde *et al.,* (2019).

Synthesis of Alkyd Resin

The synthesis of alkyd resin from *Parkia biglobosa* oil was carried out via alcoholysis process according to the procedure outlined by Abdullahi *et al.*, (2017).

Table 1. Recipe for the formation of alkyd samples.

Ingredients of alkyd samples (100 g)	
Parameters	**Amount**
Parkia biglobosa seed oil (PBSO) (%)	50
Phthalic anhydride (%)	30.2
Glycerol (%)	19.8
Mole ratio	1:1.4
Alkyd constant	1.02

Characterisation of Alkyd Resin

FTIR Analysis of the Alkyd Resin

The chemical constituents were investigated via FTIR (Agilent Cary 640) using standard procedures.

Determination of Chemical Resistance of the Resin

The test for chemical resistance of the alkyd resin was carried out using the method described by Komolafe *et al*, (2024). In this method a portion of the alkyd resin was immersed in water for sufficient time and the effect was studied. Another portion was taken for study in a brine solution and a 3 M NaOH solution. The effects were observed and recorded.

pH and Percentage Non-Volatile Determination

The pH of the resin was determined using a laboratory line digital pH, meter. The non-volatile component of the resin was determined by weighing 5 g of the sample in an open platinum crucible and then heated for 2 minutes in an electric furnace at 500 °C. The percentage non-volatile was then calculated by taken the difference of the sample and crucible before and after heating.

$$S = \frac{C - A}{B - A} \times 100$$

Where:
S = Nonvolatile content (%); B = Mass of aluminum dish and wet latex specimen (g); A = Mass of aluminum dish (g); C = Mass of aluminium dish and dried specimen after heating (g)

Production and Characterisation of Gloss Paint Formulated
The gloss paint was formulated using the procedure outlined by Oladipo *et al.,* (2013). Each component introduced into reaction vessel follows with rigorous stirring to achieve steady viscosity.

Table 2. Recipes for the formulation of gloss paint.

Components	**Amount (g)**
Alkyd resin (binder)	50
Extender ($CaCO_3$)	10
Pigment (TiO_2)	40
Driers (PbO)	5.0
Ethylene glycol	15
Kerosene	15
Diluents (thinner)	5.0
Stabilizers	5.0

Characterization of Gloss Paint Formulated
The following parameters were determined for both the alkyd resin and the gloss paint:

Determination of Density, Refractive Index and Viscosity
The density of the formulated resin was determined using the AOAC (2022) method. The refractive index of the resin was determined using Abbe refractometer which consists of double prism.

Determination of Dry Time Test, Glossiness Test/Opacity and Abrasion
The dry time of the paint sample was evaluated according to SON (2006). The paint film was applied on a furnished tin plate panel with the aid of a paint applicator and allowed to dry. The paint film became surface dry (dry to touch) and hard dry in not more than 6 hours and 24 hours respectively, from the time of application. This test was determined according to SON, (2006).

Using the gloss meter, the economy gloss paint has a minimum gloss reading of 55%. This test was evaluated according to SON (2006). Undiluted paint sample was applied to a glossy panel with a paint applicator to give a wet film of about 120 µm in thickness and was allowed to dry for 24 hours. At the end of the period, 4 ml of distilled water in the form of circular drops was placed on the film. The paint showed no blistering, swelling, wrangling or cracking within a period of 30 minutes.

Determination of Adhesion and Film Thickness Test Properties
The test was carried out according to SON (2006) method, using Cross-hatch tester. The paint showed approximately 30% maximum removal of the paint film. The film thickness was determined according to SON (2006). The dry film thickness was approximately 25 microns.

Results and Discussions
Physicochemical Properties of *Parkia biglobosa* Seed Oil
Table 3 revealed the physicochemical properties of the oil extracted from *Parkia biglobosa* seed. The extracted oil seed gave an oil yield of 24.2% (w/w), this is comparable to the 45.7% that was earlier reported for *Ximenia americana* seeds by Oladipo *et al*., (2013). The acid value of 20.62 mg KOH g^{-1} suggests low in-vivo lipolytic activities in the seed, and indicates a good non-degraded state of the oil and falls within limits for industrially useful oils. Kargioti (2021) reported that low acid values for oils are useful in the manufacture of paints and varnishes. The free fatty acid concentration of 8.45% is low, this is consistent with the low acid value observed. This is in close agreement with the 8.07% also reported by Oladipo *et al*., (2013) for *Parkia biglobosa* seed oil.

The saponification value of the PBSO is 320.10 mg/g. Komolafe *et al.,* (2024) reported the saponification value of *Parkia biglobosa* seed oil as 167 mg KOH g^{-1}. This suggests that the seed oil contain high molecular weight of fatty acid and may be suitable for preparation of soap (Oladipo *et al*., 2013). The iodine value of 120.23 g I_2 100 g^{-1} is similar compare to the iodine value of *Ximenia americana* obtained from literature reports (Oladipo *et al.,* 2008; Onukwli and Igbokwe, 2008), and thus indicates that the oil is a semi-drying oil suitable for the synthesis of alkyd resin, formulation of liquid soap and hair shampoo. The seed oil has a peroxide value of 5.50 meq kg^{-1}. The value indicates that the oil is susceptible to oxidative rancidity (Izzo *et al.,* 2021). The oil has a viscosity value of 33.28 mm^2/s, at 30 °C. The refractive index of the seed oil is 1.483, it is in close range with the refractive indices of other drying oils which are comparatively in the range 1.46 to 1.54 and this suggest that it can be used as a test for purity and as an aid to identification (BS 6900). The specific gravity of the oil is 0.87 g cm^{-3}. It is the lowest in comparison with 0.93, 0.912 and 0.931 reported for castor oil, XASO and linseed oil respectively (Majumder, 1990; Oladipo *et al.,* 2013; Omotehinse *et al*., 2019;) and the moisture content of *Parkia biglobosa* seed oil was found to be 3.1. This suggests that the seed has low susceptibility to microbial attack.

Table 3. Physicochemical properties of *Parkia biglobosa* seed oil (PBSO).

Properties	**PBSO**
Colour	Dark-yellow
Oil yield (% w/w)	24.2
Specific gravity (g cm^{-3}, 30 °C)	0.87
Viscosity (mm^2/s, 30 °C)	33.28
Saponification value (mg/g)	320.10
Iodine value (g I_2 100 g^{-1})	120.23
Acid value (mg KOH g^{-1})	20.6
Free fatty acid (% oleic)	8.45
Peroxide value (Meq/kg)	5.50
Moisture content	3.1

Characterisation of Alkyd Resin

FTIR Spectroscopic Analysis of *Parkia biglobosa* Seed Oil-Modified Alkyd Resin

The FTIR spectrum of the prepared *Parkia biglobosa* seed oil-modified alkyd resins was analysed. The peaks at 1852.57 cm^{-1}, 1789.77 cm^{-1} suggests the presence of carbonyl (C=O) group which could be for ester. The spectrum also shows peaks at 1728.91 cm^{-1}, 1729.00 cm^{-1} and 1713.86 cm^{-1} which ascribed to the aromatic ring ester bands. The broad peaks in the ranges 2854.47–2645.73 cm^{-1} suggests $-CH_2$ symmetric vibration. While the sharp peaks at 2340.77 cm^{-1}, 2348.62 cm^{-1} and 2352.34 cm^{-1} suggests the presence of asymmetric stretching of $-CH_3$ (alkyl) groups. Bending of methylene (C-H) groups suspected in the resins could be ascribed to the peaks that were observed at 1455.49 cm^{-1} respectively. The broad peaks at 3453.32 cm^{-1}, 3452.72 cm^{-1} and 3453.32 all suggests characteristic hydroxyl (-OH) groups of carboxylic acid (–COOH) present (Rickson *et al*., 2025). In-plane and out-of-plane stretching vibrations were observed at 743.78 cm^{-1} which suggests $–CH_2$ rocking (Khalid *et al*., 2014).

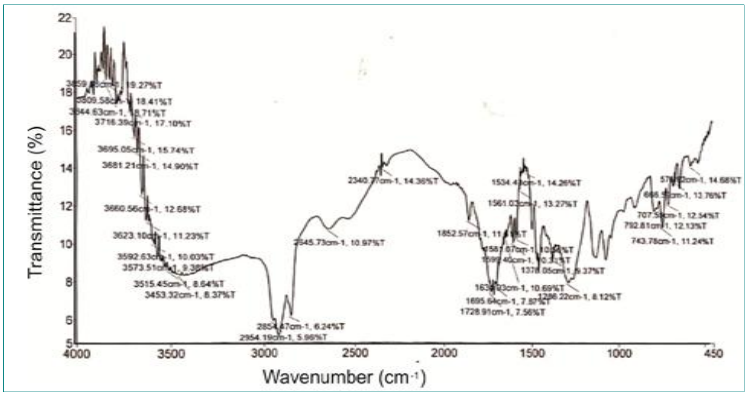

Figure 1. FTIR spectrum of *Parkia biglobosa* seed oil-modified alkyd resin.

Chemical Resistance of the Alkyd Resin

The chemical resistance of *Parkia biglobosa* seed oil-modified alkyd resin was presented in Table 4. The result shows that the resin was unaffected by brine and distilled water. However, the resin shows poor resistance to strong alkali as it blistered. According to Ahmed (2024), the presence of alkali hydrolysable ester groups in the resin is responsible for the poor resistance of alkyd film to alkali mediums.

Table 4. Chemical resistance of *Parkia biglobosa* seed oil-modified alkyd resin (PBSOM).

Media	Time (hour)	Effect on film
Distilled water	18	A
Brine	18	A
3 M NaOH	18	B
Key: A = No effect; B = Whitening; C = Blistering; D = Film removal		

Characterisation of Gloss Paint

Some Physical Properties of Gloss Paints Formulated from *Parkia biglobosa* Seed Oil Modified Alkyd Resin (PBSOM)

Some physical properties of the gloss paints formulated from *Parkia biglobosa* seed oil-modified alkyd resin (PBSOM) are given in Table 5. The physicochemical properties such as pH, viscosity, flexibility and opacity of the paints fall within the acceptable ranges for paints (SON, 1990). The paint exhibited good adhesion, tackiness and hardness properties according to Oladipo *et al.,* (2013).

Resistance to blistering of the paints formulated revealed that PBSOM passed the resistance to blistering test. This result indicates that the paints formulated have good external exposure resistance as it has been reported for other oil paints (Komolafe *et al.,* 2024). This implies that the paint can perform well when exposed to environmental conditions such as rain and sun. The drying time of PBSOM paints met specifications for oil paints. The average drying time displayed by the paints can be associated to the nature of the oil (*Parkia biglobosa* seed oil) used to synthesize the binder (alkyd resin) (Komolafe *et al.,* 2024).

The gloss results also indicated that PBSOM paints have gloss value within the range specified for a gloss paint. The viscosity of the formulated paint agrees with standard. The range of viscosity observed for the paint sample makes it more suitable for application by brush or spray. The interaction of various constituents determines its viscosity. Viscosity affects the application and flow properties of a coating and is generally adjusted to the intended application (Gidigbi *et al*., 2023).

Table 5. Results of some physical properties of paints formulated (PBSOM).

Property	PBSOM	SON standard
Stickiness	Pass	Pass
pH	7.82	7-8.5
Adhesion	Pass	Pass
Blistering	Pass	Pass
Viscosity (centipoise)	128	22-150
Glossiness	Pass	Pass
Opacity	Pass	Pass
Flexibility	Pass	Pass
Stability	Pass	Pass
Refractive index	1.481	1.47-1.50
Drying time (min)	131	120-180

Chemical Resistance of the Paints Formulated with PBSOM

The chemical resistance of a paint/coating film may be a significant factor determining its stability and durability after application. The results of the effects of three typical mediums (i.e. NaCl; ionic, NaOH; alkaline and HCL; acidic) on the surfaces coated with the paint samples are presented on Table 6. All paint samples show no effect, hence a good resistance to these mediums indicates that the paint is hence suitable for application and can thus withstand some environmental condition. Similar observation was reported for other oil paints by Chiplunkar and Pratap (2016).

Table 6. Chemical resistance of the paints formulated with PBSOM.

Paint sample	Distilled water	0.1 M HCL	0.1 M NaCl	0.1 M NaOH
50% oil length	A	A	A	A
PBSOM paint	A	A	A	B
Key: A = No effect; B = Wrinkle; C= Film removed				

Conclusion

The research study assessed the use of modified *Parkia biglobosa* seed oil-alkyd resin (PBSOM) for the production of solvent-based paint. The characterisation of the seed oil agrees with literature. The *Parkia biglobosa* seed oil was processed and 50% of the processed *Parkia biglobosa* seed oil was used to modified conventional alkyd resin (PBSOM). The FTIR of the PBSOM was in conform with conventional alkyd resin. The synthesized PBSOM resin exhibits good resistance to chemical interaction. The solvent-based paint produced also exercise good properties and in conformity with the standard. Hence, the PBSOM resin could replace conventional alkyd resin, thereby reduces cost of production and contribute to the industrial suitability.

Declarations

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References

1. Abdullahi, S., Aliyu, B.A., Nkafamiya, I.I. and Barminas, J.T. 2017. Application of *Luffa aegyptiaca* seed oil in the synthesis of an oil-modified alkyd resin. International Journal of Innovative Research and Advanced Studies, 4(1): 6–8.
2. Ahmed, S. 2024. Alkyds from vegetable oils for surface application. In: Vegetable oil-based polymers and their surface applications (pp. 33–50). Elsevier.
3. Akinterinwa, A., Odetoye, T.E. and Akinhanmi, T.F. 2015. Paints and coatings: Technology, applications, and environmental considerations. International Journal of Scientific and Engineering Research, 6(7): 112–118.
4. AOAC International. 2022. Official methods of analysis (21st ed.). AOAC International.
5. Babanyaya, A., Osemeahon, S.A., Gidigbi, J.A. and Apolmi, G. 2024. Copolymerisation of dimethylol urea with hydroxylated watermelon seed oil as binder for emulsion paint formulation. Journal of Basic Physical Research, 12(1): 63–72.
6. Chiplunkar, P.P. and Pratap, A.P. 2016. Utilization of sunflower acid oil for synthesis of alkyd resin. Progress in Organic Coatings, 93: 61-67.
7. Dagde, K.K., Iyagba, E.T. and Nkafamiya, I.I. 2019. Determination of physicochemical properties of vegetable oils for industrial applications. Journal of Applied Sciences and Environmental Management, 23(2): 215–220.
8. Gidigbi, J.A., Abubakar, A.B., Ngoshe, A.M. and Okomah, Y.E. 2023. Formulation of emulsion paint using benign HGSO/PVAc copolymer as a binder. International Journal of Chemistry and Materials Research, 11(1): 1-7.
9. Gidigbi, J.A., Osemeahon, S.A., Ngoshe, A.M. and Babanyaya, A. 2019. Modification of polyvinyl acetate with hydroxylated avocado seed oil as a copolymer binder for possible application in coating industry. International Journal of Recent Innovations in Academic Research, 3(2): 231-244.
10. Hassanpour, M. 2021. A review of four kinds of resin production technologies based on recent developments. International Journal of Industrial Engineering, 8(2): 1–12.

11. Hieda, N., Nishida, M. and Matsuno, I. 2022. Improvement in the reliability of AOAC Official Method SM 2012.15 for iodine, Part-2. Journal of AOAC International, 105(6): 1611-1616.
12. Ifijen, I.H., Maliki, M., Odiachi, I.J., Aghedo, O.N. and Ohiocheoya, E.B. 2022. Review on solvents based alkyd resins and water borne alkyd resins: Impacts of modification on their coating properties. Chemistry Africa, 5(2): 211-225.
13. Izzo, F.C., Källbom, A. and Nevin, A. 2021. Multi-analytical assessment of bodied drying oil varnishes and their use as binders in armour paints. Heritage, 4(4): 3402-3420.
14. Kargioti, E., Vouvoudi, E., Nannou, C., Bikiaris, D. and Lambropoulou, D. 2021. Unraveling the origin of aged varnishes for the proper restoration of old paintings using spectroscopic and spectrometric techniques. Microchemical Journal, 168: 106467.
15. Khalid, A., Ahmad, S. and Khan, M.I. 2014. FTIR spectroscopic analysis of vegetable oils and their chemical functional groups. Journal of Applied Sciences, 14(4): 456–462.
16. Komolafe, C.A., Dada, A.O., Afolabi, Y.T. and Ajao, F.O. 2024. Effects of thermal process techniques on the imperative parameters of extracted oil from *Parkia biglobosa* beans (African locust beans). Biomass Conversion and Biorefinery, 14(24): 31141-31156.
17. Kumar, S., Kumar, S. and Namburi, E.P. 2024. Functional paints and coatings. In: Namburi, E.P., Wanhill, R.J.H. and Setua, D.K., (Eds.), Novel defence functional and engineering materials (NDFEM) (Vol. 1, pp. 219–246). Springer Nature Singapore.
18. Li, M., Li, Y., Zong, Y., Song, Y., Liao, Y., Yang, Y. and Zhu, Y. 2023. Application of manganese-based driers in tung oil: Drying behavior, paint film properties, and drying mechanism. Industrial Crops and Products, 206: 117733.
19. Liu, M., Liang, J., Jing, C., Yue, Y., Xia, Y., Yuan, Y. and Yue, T. 2023. Preparation and characterization of *Lycium barbarum* seed oil Pickering emulsions and evaluation of antioxidant activity. Food Chemistry, 405: 134906.
20. Majumder, S.K. 1990. Vegetable oils: Chemistry and technology. New Delhi, India: Allied Publishers.
21. Oladipo, G.O., Eromosele, I.C. and Folarin, O.M. 2008. Chemical characterization of seed oils for industrial applications. Journal of Applied Sciences, 8(5): 912–917.
22. Oladipo, G.O., Eromosele, I.C. and Folarin, O.M. 2013. Formation and characterization of paint based on alkyd resin derivative of *Ximenia americana* (wild olive) seed oil. Environment and Natural Resources Research, 3(3): 52-62.
23. Omotehinse, S.A., Igboanugo, A.C., Ikhuoria, E.U. and Ehigie, C.A. 2019. Characterization of castor seed oil extracted from the seed species native to Edo State, Nigeria. NIPES-Journal of Science and Technology Research, 1(1): 45-54.
24. Onukwli, O.D. and Igbokwe, P.K. 2008. Production and characterization of *Ximenia americana* seed oil for industrial applications. Journal of Applied Sciences, 8(16): 2847–2852.
25. Rickson, N.H., Inyanda, D.O., Samuel, H.S., Jafar, M., Sunday, E.S. and Etim, E.E. 2025. Phytochemical and FTIR spectroscopic analysis of *Balanites aegyptiaca* seed and stem bark extract. Journal of the Chemical Society of Nigeria, 50(1): 223-236.
26. Standards Organisation of Nigeria. 2006. Specifications for gloss paints for decorative purposes (Nigerian Industrial Standard). Standards Organisation of Nigeria.

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