Cashew (Anacardium occidentale) is a widely grown cash crop in Nigeria. Bulk of the harvested nuts are exported as raw materials. During processing, a large amount of cashew nut shells are generated as wastes thereby constituting environmental hazards. This research is aimed at reducing these wastes by converting the nut shells liquid to useful antifungal and antibacterial agents.

Cashew nut shell liquid was extracted from cashew nuts by cold methanol extraction. Isolates from the extracts were modified by nitration and esterification. Also, metal complexes were synthesized using standard methods. Characterization of all the compounds and complexes were done by spectroscopic analyses using Fourier transform Infrared (FTIR), UV-Visible, 1H and 13C Nuclear Magnetic Resonance (NMR). The products were tested against selected bacteria and fungi. Data generated were analysed and presented using descriptive statistics and analysis of variance.

Anacardic acid (AA), cardanol, and cardol were isolated as semi-solid (deep brown), pink and dark pink liquids with 31.5 %, 10.0 %, and 20.0 % yields, respectively. Esterification of AA with propanol gave a black gelly compound, propyl anarcardate (PAA), 33.0% yield. Nitration of AA gave nitroanacardic acid, 91.2% yield; cardanol gave nitrocardol, 60.4 % yield and nitrationof cardol gave nitrocardol with 51.8 % yield. All the nitro compounds are yellow liquids. AA complexes of cobalt, copper and zinc were synthesized as 17.0 % black, 72.5 % brown and 58.0 % dark green respectively.

Zinc complex of nitrocardanol was synthesized as a black solid with 29.0 % yield. Copper complex of cardol was synthesized as a brownish solid, 81.0 % yield. Nitrocardol complexes of cobalt, copper and zinc gave pink, green and dark brown powders with 5.0 %, 30.0% and 5.0 % yields respectively. FTIR spectra showed absorption bands for –OH at (3196-3550) cm-1, -C=O 91620-1701)cm-1, C=C (160-1608)cm-1, -No2 (1543-1580) cm-1, M. O, (437-475) cm-1, etc) H NMR spectra gives signal for protons at different chemical environments (o 12.3 ppm for -COOH, 0 (6.5-7.2)ppm for benezene. o (0.9-1.98) ppm for different protons on the alkyl side chain. 13C NMR spectra showed signals at o 168 ppm for –COOH, o (109-145) ppm for the benzene o (14-52) ppm represent carbon atoms for alkyl group which tallies with the 1H NMR. PAA produced significantly wide antibacterial zone of inhibition against Pedobacter mendelii (17.0 -+ 0.7 mm) ($P > 0.05$) better activities against Penicillium citrinum (30-+7.07mm, 15 -+ 2.83mm, and 13.0 +1.4 mm), respectively, than clotrimazole (12.5 + 0.71 mm).

Overall, three compounds were isolated from CNSL from which eight new metal complexes were synthesized. Two of the compounds (PAA and nitrocardol)and six of the complexes were found to have promising antimicrobial activities. Results from this study suggest that some of these compounds and metal complexes are potential antibacterial and antifungal agents. Further studies are required to evaluate other therapeutic activities.