SUMMARY

- The coconut shells for the present study were collected from the local market in Thiruvallur district, Tamilnadu, India and Cashewnut shells were collected from Panruti, Tamilnadu, India.
- The oil from Coconut shells (CSO) and Cashewnut shells (CNSO) were extracted by pyrolysis method.
- Phytochemical analysis of CSO and CNSO were done in five different solvents namely ethanol, acetone, chloroform, petroleum ether and aqueous.
- The phytochemical analysis of CSO showed the presence of alkaloids, carbohydrates, saponins, phenols, tannins, flavonoids, amino acids, terpenoids, proteins, quinones, oxalate, carboxylic acid and xanthoproteins
- Phytochemical screening of CNSO exhibited alkaloids, carbohydrates, saponins, phenols, tannins, flavonoids, amino acids, diterpenes, terpenoids, proteins, steroids, oxalates, anthocyanin, leucoanthocyanin, coumarin and xanthoproteins.
- The antibacterial activity of ethanol, chloroform, acetone, petroleum ether and aqueous extracts of CSO and CNSO was tested against *Staphylococcus aureus, Enterococcus faecalis, Escherichia coli, Klebsiella pneumonia, Pseudomonas aeruginosa* and *Salmonella paratyphii.*
- The CSO extract shows higher antibacterial activity against all the tested bacteria. In the ethanol extract of CSO the highest inhibition zone recorded against *S. aureus.* Acetone extract of CNSO exhibits a greater zone of inhibition against *Pseudomonas* and petroleum ether extract shows the highest zone of inhibition against *Klebsiella.*
- The antifungal property of ethanol, chloroform, acetone, petroleum ether and aqueous extracts of CSO and CNSO was studied using fungal pathogens namely *Epidermophyton floccosum, Aspergillus niger, Penicillium, Microsporum, Candida albicans* and *Aspergillus flavus.* The acetone and chloroform extracts of CSO and CNSO showed moderate activity. The aqueous extract showed less activity.
- The Minimum Inhibitory Concentration of CSO and CNSO was determined to inhibit the growth of *S. aureus*.

- The ethanol extract of CSO and CNSO showed free oxygen radical scavenging capability.
- By HPTLC quantitative analysis, 7 compounds were recorded in ethanol extract of CSO and 14 compounds in ethanol extract of CNSO.
- By GCMS analysis, 20 compounds were obtained in the CSO, among which Acetamide 2,2,2- trifluoro methyl ester shows highest peak area. The ethanolic extract of CNSO on GCMS analysis showed 30 peaks, and the highest peak is 9- octadecenoic acid followed by Hexadecanoic acid. The remaining known compounds were detected in minor quantities with the least area.
- The cancer cells viability decreases as the concentration level increases with the ethanolic extract of CSO and CNSO. The IC_{50} value of CSO was 125µg/mL and CNSO is 62.5 µg/mL.
- In CSO, the molecule, Methyl 3β- hydroxyl- bisnorellocholanoate (Ligand-3) was found to bind with stronger affinity than all other molecules with target protein HER2 and for CNSO the molecule, 9,12-octadecadienoic acid (Ligand-6) was found to bind with stronger affinity than all other molecules with target protein HER2.
- In the docking studies with protein EGFR, the Methyl 3β- hydroxyl- bisnorellocholanoate (Ligand-3) molecule, obtained from CSO show maximum binding affinity in Autodock and Autodock Vina. For CNSO, the molecule, 9,12-octadecadienoic acid (Ligand-6) got the best affinity in both the docking tools.
- In the docking studies with Heat shock protein (HSP 90-alpha), Methyl 3β- hydroxyl- bisnorellocholanoate (Ligand-3) from CSO and 9,12-octadecadienoic acid (Ligand-6) from CNSO got better binding affinity in both the docking tools.
- There are five amino acids that were found to fall in the interaction site with that of the inhibitor namely ASP93, THR184, GLY97, LYS58, ASN51. Except for ASN51, all the amino acids made hydrogen bonding interactions.
- The quality of biofuels obtained from the CSO and CNSO was analyzed based on the properties namely kinematic viscosity, flashpoint, density at 15^{o}C, gross calorific value and cetane number which is compared with standard fuels and it is considered as a good replacement biofuel.