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Augmentation of Phytochemical from Ultrasound-Assisted Ethanolic Extraction of *Piper sarmentosum* for Enhanced Therapeutic Potential

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Piper sarmentosum, commonly known as "kaduk", has long been used in traditional medicine and Malaysian food. *P. sarmentosum* is holistically used for traumatic and rheumatic pain, abdominal distention and shows ant-inflammatory effects. In the light of these benefits, the present study assessed ultrasonic assisted ethanolic extraction of *Piper sarmentosum* (UAEPS) for augmented phytochemicals its effectiveness in *in-vitro* examination of antioxidant, antibacterial and anticancer activities. The moisture content of *Piper sarmentosum* was assessed as 10%. The extract was produced under optimized ultrasonic-assisted extraction technique for significantly enhanced phytochemical yield (912.7mg/5g of dry powder). Phytochemical evaluation revealed presence of augmented phenolic and flavonoid content, saponins, steroids, tannins, reducing sugar and alkaloids. The antimicrobial impact by clear zones of inhibition against Gram-positive (*Staphylococcus aureus*) Gram-negative (*E. coli*) whereas, *P. aeruginosa* were resistant against UAEPS confirmed by well diffusion assay. Result obtained from MTT assay on neuroblastoma cell lines (SH-SY5Y-CRL-2266) revealed the cell death on dose dependent manner with IC50 as 290µg/mL compared with control cell indicate the anticancer efficacy of UAEPS along with notable free radical inhibition of DPPH. Research findings UAEPS showed enhanced phytochemical content with particularly strong antioxidant, antimicrobial and anticancer capabilities in neuroblastoma cells. Our research suggests that UAEPS warrant further study as a promising source of bioactive drug leads which can pave the way for therapeutic applications in antimicrobial and anticancer formulations.

Keywords: Antimicrobial, Anticancer, DPPH scavenging activity, Neuroblastoma cells, *Piper sarmentosum* leaf

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