Daphnia pulex heart rate, highly sensitive to toxins, serves as a quantifiable indicator of chemical toxicity, offering a non-specific screening method for assessing systemic effects beyond aquatic ecosystems. Exposure to chemicals extracted from thermal bill paper caused a dose-dependent decrease in Daphnia heart rate, with complete cardiac arrest (0 bpm) observed at 5 mg/L after 24 hours. This cardiotoxicity, increasing with concentration and exposure time, highlights the potential human health risks, mirroring the cardiovascular effects of Bisphenol S (BPS) found in thermal paper. Analysis identified BPS and Diphenyl Sulfone (DPS) in the paper extract. In-silico analysis using SwissADME predicted high bioavailability for both, with DPS potentially crossing the blood-brain barrier. The acute toxicity of these compounds, confirmed by Daphnia tests, emphasizes the need for safer alternatives in thermal bill paper production due to potential adverse health and environmental impacts. The study utilized FTIR, HR-MS, .and in-silico tools for a robust safety assessment