

Comparative Analysis of the Anti-cholesterol Activity and Phytochemical Analysis of *Biophytum reinwardtii*, *Trachyspermum roxburghianum* and *Cyanthillium cinereum* extracts

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Abstract

Biophytum reinwardtii, *Trachyspermum roxburghianum*, and *Cyanthillium cinereum* are traditional herbs in Ayurvedic medicine known for treating hypertension, fatty liver, and obesity. Abnormal cholesterol levels are considered as a contributing factor for these conditions. However, the anti-cholesterol properties of these herbs, which are highly valued in Ayurvedic medicine are yet to be explored. This research aimed to evaluate the anti-cholesterol activity of different plant extracts and analyze qualitative and quantitative phytochemicals. Plant extraction was carried out by maceration using three different solvents: n-hexane, ethyl acetate, and methanol. The resulting extracts were subjected to an in vitro cholesterol reduction assay. Qualitative and quantitative phytochemical analysis of the above three plants were performed exclusively on the methanolic extracts, which exhibited the highest anti-cholesterol activity. All three plants exhibited significant anti-cholesterol activity compared to the standard Simvastatin, with the methanolic extracts showing the highest IC₅₀ values. Specifically, *C. cinereum* demonstrated the highest anti-cholesterol capacity, with an IC₅₀ value of 17.48 mg/mL. *B. reinwardtii* and *T. roxburghianum* exhibited anti-cholesterol activity with IC₅₀ values of 30.42 mg/mL and 27.83 mg/mL, respectively. Phytochemical analysis revealed the presence of phenols, saponins, alkaloids, tannins, flavonoids, and steroids in all methanolic extracts. Notably, the methanolic extract of *C. cinereum* displayed the highest total flavonoid content (8.23% w/w) and total saponin content (9.18% w/w), while *B. reinwardtii* had the highest total alkaloid content (6.6% w/w). These findings highlight the potential of the methanol extract of *C. cinereum* as a cholesterol-lowering drug.

Keywords: *Anti-cholesterol activity, Phytochemical*