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**(57) Abstract :**

The present invention relates to a standardized method for evaluating *Amaranthus cruentus* leaf extracts through physicochemical, phytochemical, fluorescence, and chromatographic techniques. Key parameters such as loss on drying, swelling index, foaming index, and extractive values are assessed to ensure the quality and consistency of the plant material. Fluorescence analysis under UV and visible light identifies bioactive compounds, while Soxhlet extraction with solvents of increasing polarity (petroleum ether, chloroform, and ethyl acetate) extracts a wide range of phytochemicals. Phytochemical screening reveals the presence of various bioactive constituents. Thin Layer Chromatography (TLC) and High-Performance Thin Layer Chromatography (HPTLC) are employed to separate and quantify gallic acid and rutin, providing precise data for standardization.

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