

***EGFR* Gene Expression in A549 Lung Cancer Cells Treated with 70% Ethanolic *Murraya koenigii* Extract**

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Structured Abstract

Background: Lung cancer remains a major global health concern and is among the leading causes of cancer-related deaths. Despite advancements in targeted therapies, current treatments often result in drug resistance and severe side effects. *Murraya koenigii* (curry leaves), traditionally used in herbal medicine, contains bioactive compounds with known antioxidant, antimicrobial, and anticancer properties. While its effects on colon and breast cancer are documented, limited research explores its impact on lung cancer. This study aims to evaluate the effects of *M. koenigii* ethanolic extract on A549 lung cancer cells, with a focus on changes in *EGFR* gene expression.

Methods: An ethanolic extract (70%) was prepared from *M. koenigii* leaves and used to treat A549 cells at concentrations of 50 µg/mL and 100 µg/mL for 24 hours. Morphological changes were assessed using an inverted microscope. Total RNA was extracted and reverse transcribed into cDNA. RT-PCR was performed to amplify the *EGFR* gene (132 bp) and *ACTB* gene (168 bp) as the internal control. Agarose gel electrophoresis was used to visualize and compare gene expression levels.

Results: Cells treated with *M. koenigii* extract showed morphological alterations such as cell rounding, shrinkage, and detachment, more prominent at higher concentrations. *ACTB* was consistently expressed across all groups, confirming RNA integrity and successful cDNA synthesis. *EGFR* gene was amplified in all samples, but no significant differences in band intensity were observed, suggesting that the extract did not significantly alter *EGFR* expression under the tested conditions.

Conclusion: Although *M. koenigii* extract induced cellular stress and morphological changes in A549 cells, its impact on *EGFR* gene expression was minimal at the tested concentrations and duration. Further studies involving higher doses, longer exposure, quantitative PCR, and protein-level analysis are recommended to fully understand its therapeutic potential in lung cancer treatment.

Keywords: Lung cancer, *Murraya koenigii*, A549 cells, *EGFR* gene, RT-PCR

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