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# Synergistic enhancement of *in-vitro* cell migration by ethuliacoumarin and stigmasterol from *Jeffreycia zeylanica*: A preliminary investigation using the response additive approach

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Scratch wound assay (SWA) directed fractionation of the hexane extract of aerial parts of *J. zeylanica* led to the isolation of ethuliacoumarin (1) and stigmasterol (2). These two compounds exhibited enhanced *in-vitro* cell migration activity each at 12.5 μM (1-67.0% and 2-73.5%) compared to the negative control (20.1%) in SWA performed on Madin-Darby Canine Kidney (MDCK) cells. The interaction between 1 and 2 was studied by employing the response additive approach. In this method, the SWA was performed for compounds 1 and 2 separately at the doses lower than $ED_{50}$ and the dose pair combinations of compounds 1 and 2 in which the concentration of each is less than its $ED_{50}$ value. The mean percent wound closures ($E_{Observed}$) were determined for each dose pair combination. For each dose pair, the expected additive effect ($E_{Expected}$) was determined by summing the mean percent wound closures observed for each compound when they were individually subjected to SWA at the corresponding doses in the combinations. The combination index (*CI*) for each dose pair combination was calculated. It was found that the tested dose pair combinations showed significantly higher cell migration effect ($E_{Observed}$) than the expected additive effect ($E_{Expected}$) in which $CI > 1$. Therefore, the presence of ethuliacoumarin (1) and stigmasterol (2) in the hexane extract of aerial parts of *J. zeylanica* may contribute synergistically to its effective cell migration activity. Further studies with different pharmacological approaches/models are necessary to draw firm conclusions on the interaction between compounds 1 and 2.

**Keywords:**

Synergistic interaction, cell migration, ethuliacoumarin, stigmasterol, *Jeffreycia zeylanica*

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