

TITLE: Investigating the active ingredient in *Eupatorium capillifolium* anti-quorum sensing properties

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Introduction: *Eupatorium capillifolium* is a plant that grows abundantly in the southeast of the United States, and it is commonly known as dog fennel. Dog fennel is recognized as a weed, being very resistant in nature, as it requires minimal conditions to thrive. *E. capillifolium* has shown some medicinal uses according to past folklore, and is also used as an insect repellent in present day. Previous research on *E. capillifolium* has suggested that it has anti-quorum sensing capabilities against *Chromobacterium violaceum*. *C. violaceum* is a gram negative bacteria that is not normally detrimental to human health; however, for those immuno-compromised, it may have harmful effects. Like that of many other bacterial species, *C. violaceum*, uses quorum sensing to maintain its virulence.

Purpose: This study will attempt to find the active ingredient of *E. capillifolium* with anti-quorum sensing properties.

Method: This experiment will be carried out utilizing TLC bioassays, column chromatography and activity-driven fractionations.

Results: The initial results of the TLC bioassay showed *E. capillifolium* leaf extract formed zones of inhibition at a RF range of 0.083-0.33. Column chromatography was utilized to further separate the plant extract compounds, and furthermore, activity-driven fractionations will be used to determine specific compounds of *E. capillifolium* that inhibits quorum sensing in *C. violaceum*.

Conclusion: The rise of multi-resistant bacteria is a common concern among those in the healthcare industry. Alternative methods of combating pathogenic bacteria are deeply investigated as they may solve problems of medicine. An answer to these ordeals may be answered with the use of plants as natural alternatives and their innate anti-quorum sensing properties.