

## The Anti-quorum Sensing Activity of *Salvia fruticosa* MILLER and *Lavandula stoechas* L. subsp. *stoechas* Essential Oils

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**Aim of the study:** In this study, the anti-quorum sensing (QS) activity of the essential oils (EOs) obtained from *S. fruticosa* and *L. stoechas* subsp. *stoechas* were investigated. *S. fruticosa* and *L. stoechas* subsp. *stoechas* are known as “sage” and “karabas” in Turkey, and the EOs and aerial parts used as tea to treatment for various diseases. This study is important because it is the first time that the anti-quorum sensing effect of these two EOs have been revealed.

**Material and Methods:** Aerial parts of *S. fruticosa* and *L. stoechas* were collected by local residents in Mugla province of Turkey and EOs obtained by using the hydrodistillation method. Quorum sensing, violacein pigment production, and swarming/swimming migration inhibition activities were determined using *Chromobacterium violaceum* CV 026, CV 12472 and *Pseudomonas aeruginosa* PA01 strains, respectively.

**Results:** The minimum inhibitory concentrations (MIC) of the *S. fruticosa* oil were determined as 0.78 µl/ml against *C. violaceum* CV 026 and, CV 12472. The MIC values of *L. stoechas* essential oil against *C. violaceum* CV 026 and, CV 12472 were 0.39 µl/ml. After this stage of the study, sub-MIC concentrations of EOs were selected to further anti-QS activity assays. The agar-well diffusion assay using reporter strain CV 026 indicated that the EOs had no anti-QS activity. In qualitative and quantitative analyses have observed that essential oils reduce high levels of violacein pigment production. The MICs of EOs against *P. aeruginosa* PA01 were >50 µl/ml. The EOs inhibited QS dependent swarming/swimming migration in a concentration-dependent manner. For the concentration of 50 µl/ml EOs, the inhibition rates in swarming and swimming of PA01 were 40.0% and 15.0% for *S. fruticosa*, 38.0% and 30.0% for *L. stoechas*, respectively. The results showed that the EOs obtained from *S. fruticosa* and *L. stoechas* significantly inhibited QS-dependent violacein production in CV 12472, and CV026 and swarming migration in a concentration-dependent manner in *P. aeruginosa* PA01.

**Keywords:** *Salvia fruticosa*, *Lavandula stoechas* subsp. *stoechas*, Anti-QS, Violacein pigment production, Swarming/swimming migration.