

## Evaluation of the anti-*Vibrio* activity of essential oils and their components

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*Vibrio harveyi* is a major pathogen of marine fish and shrimp, which causes significant losses in the aquaculture industry worldwide. Essential oils and their components are concentrated hydrophobic liquid containing volatile aroma compounds from plants.

Since the past a few decades, they have been widely used for bactericidal or fungicidal, which not only in the pharmaceutical industry but also in the agricultural industry, especially in aquaculture. Furthermore, a variety of essential oils and their components have been claimed they are quorum sensing inhibitors, which can interfere with the virulent quorum sensing signal in bacteria. However, knowledge on the impact of essential oils and their components on the volatile antimicrobial activity and quorum sensing inhibition in *V. harveyi* is lacking.

In the present study, we evaluated the vapour-phase-mediated antimicrobial activity (VMAA), different concentration of antimicrobial activity and specific quorum sensing-inhibitory activity (AQSI) of 22 essential oils and 12 essential oil components, against *V. harveyi*. Results showed that the VMAA of a volatile spread symmetrically across a microtiter plate and one-quarter of the tested essential oils and their components showed growth-inhibitory VMAA at 24h. Then, six essential oils and three essential oil components inhibited 50% of the growth at 0.0001%, compared to the control. Moreover, just the four most active essential oils inhibited quorum sensing at 0.001%, with AQSI higher than 2. In conclusion, the anti-*Vibrio* activity of essential oils and their components both in broth cultures and via their vapour-phase. Not all the essential oils and their components are able to inhibit quorum sensing in *V. harveyi*. And two essential oils and one essential oil component were considered to be highly promising to control *V. harveyi* in aquaculture.

Keywords: Essential oil; *Vibrio harveyi*; Vapour-phase; Quorum sensing