

Anti-quorum sensing potential of phytochemicals against food borne pathogens

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Anti-quorum sensing (QS) molecules can inhibit the microbial communication by blocking the signaling systems and thus protect the food from spoilage. To screen phytochemical with anti-QS potential violacein inhibition assay using *C. violaceum* and swarming assay was done against *S. typhi, Y. enterocolitica, E. coli* and *K. pneumoniae*. Further, anti-pathogenic potential was assessed by MATH assay, EPS quantification assay, blood sensitivity assay and disc diffusion test. Whole transcriptomic analysis has been done by RNA sequencing. Molecular docking sudies are also done to confirm the anti-QS activity. Upon screening many GRAS phytochemicals vanillic acid and tannic acid have exhibited significant inhibition of swarming motility of *Y. enterocolitica* and *S. typhi*. Petunidin has been found with anti-biofilm and anti-QS activity and confirmed with molecular docking study against QS regulatory protein of *K. pneumoniae*. Antibiotics resistance has been effectively breched symbiotically by these phytochemicals. Nano emulsions of *Cuminum cyminum* and *Piper nigrum* oils have been demonstrated with anti-QS potential against *E. coli* and *S. typhi*. In furtherance, these phytotherapeutics have been identified to inhibit many QS related virulence such as swarming motility, cell surface hydrophobicity and EPS production by quantitative assays. Moreover, reduction of antibiotic resistance and blood resistivity of *S. typhi* and *Y. enterocolitica* by tannic acid and vanillic acid was also demonstrated by disc diffusion and blood sensitivity assays. Whole transcriptomic analysis has been done to confirm the anti-QS activity of vanillic acid anainst *Y. enterocolitica*. Thus the identified actives has immense potential as a promising biopreservative and biotherapeutic agents.

Biography

Prof. Prathapkumar Shetty Halady is serving as Professor at Pondicherry University, India since 2012. He is also member of scientific panel on contaminants in food chain,Food Safety and Standards Authority of India (FSSAI), Ministry of Health and Family Affairs. Govt of India, 2017-2019. Currently he is serving as Dean Research of the University. He has published 62 quality research publications in peer reviewed international journals and filed 2 patents.

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