Title: Screening of Epiphytic Bacteria associated with *Halymenia durvillei* for Antimicrobial and Anti-Quorum Sensing Activity**.**

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Abstract- Seaweed harbor mutualistic epiphytic bacteria. This mutualistic relationship has complicated nutrient exchanges, and it is speculated that intimate bio-compound symbioses exist. Epiphytic bacteria produce enzymes for metabolizing chemicals and play an important part in algal defense by making various molecules. The study aims to isolate epiphytic bacteria associated with *Halymenia durvillei* and test their antimicrobial activity against a variety of human pathogens and anti-quorum sensing utilizing *C. violaceum. Vibrio owensii* (EPB 1 and EPB 3) *Vibrio rotiferianus Vibrio harveyi, Vibrio alginolyticus, Alteromonas sp.,* (EPB 7 and EPB 17) *Alteromonas portus Bacillus sp.,*(EPB 8 and EPB 14) *Bacillus altitudinis, Oceanobacillus sp., Bacillus safensis,* and *Bacillus australimaris* were identified by 16S rRNA gene sequencing. The results of antimicrobial studies revealed that 14 isolated epiphytic bacteria had antimicrobial capabilities against test pathogen (*E. coli, S. marcescen, S. aureus, S. epidermidis*), which are sensitive to 100 mg/mL crude extract and demonstrate a zone of inhibition. Only two epiphytic bacteria out of 14 exhibited have a positive result in the anti-quorum sensing test. Overall. The crude extract from epiphytic bacteria is a possible bioactive chemical, particularly the crude extract from *Bacillus safensis* (EPB 9), which exhibits antibacterial and anti-quorum sensing properties and could be used to create an evolutionary infectious agent. The isolated epiphytic bacteria's ability to produce a possible bioactive medication opens new biotechnological and biomedical research opportunities.

Keywords: *Halymenia durvillei*, Epiphytic bacteria, 16SrRNA, Antimicrobial activity, Anti quorum Sensing, *Chromobacterium violaceum*.