CHAPTER 9 : CONCLUSION AND FURTHER DIRECTION

9.1 Conclusion

This study demonstrated the antibacterial properties of date fruit, including its ability to kill the bacteria and preventing bacterial adhesion that leads to gastroenteritis. The antibacterial activity of date extracts was found to be dose-dependent, where higher concentration exhibited higher bacterial inhibition zone. Furthermore, methanol extracts were the most active extracts compared to aqueous extracts with higher inhibition zone and lower MIC/MBC values, while hot aqueous extracts showed the highest anti-adhesion activity against all tested bacteria.

The preparation of Ajwa dates-infused water according to the Prophet Muhammad's (PBUH) practice demonstrated the antimicrobial activity against the tested bacteria, which also had a positive correlation with phytochemical content in the Ajwa dates-infused water. Among all date varieties, Ajwa date hot aqueous extracts were recorded with significantly higher inhibition zone and anti-adhesion activity compared to Medjool and Mariami extracts. Ajwa dates also contained more phytochemical compound, including higher phenolic and flavonoid contents compared to Medjool and Mariami dates. The isolation of active compound in Ajwa dates revealed that the flavonoid compounds in the dates had a role in the antibacterial activity and an ability to cause ultra-structural damage to the bacterial cell wall, which led to cell death.

9.2 Significance of The Finding

The benefits of Ajwa date stated in numerous Hadith and Quranic verses have been proven through its antibacterial and anti-adhesion properties against bacterial gastroenteritis. This study also showed the wisdom of the Prophet Muhammad's (PBUH) practice of consuming date fruits and the antibacterial activity in dates-infused water for the prevention of gastroenteritis. Due to its antibacterial properties, Ajwa date fruits can be consumed as a functional food or used as complementary alternative treatment to prevent/treat bacterial gastroenteritis.

9.3 Future Direction

Based on the study results, the following are the recommendations for future research:

1. The mechanism regarding the anti-adhesion activity and the changes of a virulence factor of each tested bacterium after the treatment with date fruit extracts at the molecular level should be elucidated.
2. Comprehensive research on isolation is recommended, while the novel active compound in date fruits extracts, which may be responsible for the antimicrobial activity, should be discussed on.
3. Observation of the overall effects of date fruits and toxicity effects (if any) in the animal model is recommended in in-vivo studies.