

CHAPTER 5: CONCLUSION

5.1. Conclusion

Curcuma zedoaria is being used in many countries as a valuable medicinal plant with much attention given to its antimicrobial agent. The few earlier reports focused on the antibacterial or antioxidant activity of this plant as this experiment also did but with a major difference which was applying to the PGRs in the culture media and comparing the *in vitro* system with the natural plant so called *in vivo* system.

The results and findings in this study support the use of *Curcuma zedoaria* in the *in vitro* systems for the treatment of bacterial infections as it has great advantages over the *in vivo* system since it is more time saving and in some cases stronger to treat microbial infections.

Evidently, the micropropagation of the *Curcuma zedoaria* needs a precise and careful treatment due to its potential to get contaminated in the media.

The use of different plant growth hormones and different concentrations of PGRs can still be performed to have clearer results for the antibacterial activity of this Zingiberaceae family member; thus this experiment can still be developed for better understanding of *Curcuma zedoaria* antimicrobial activity.

Being the most sensitive bacteria against *Curcuma zedoaria* extracts, gram positive bacteria such as *Staphylococcus aureus* had the best results among all 4 strains. This together with the fact that *Staphylococcus aureus* is one of the most important issues in today's hospital environments, make the future of this study more noticeable and can bring more ideas and thoughts to the future working people who are interested to work with *Curcuma zedoaria*.



5.2. Suggestions for future research

Curcuma zedoaria has great properties such as antioxidant activity which can be performed in a similar work with this thesis using both systems (*in vitro/in vivo*).

The *in vitro* system has a wide range of potential abilities which are not yet employed.

For further studies it is highly recommended to work on the *in vitro* systems for this plant and to try multiple combinations with various ranges of PGRs.

The antiviral assay is one of the suggestions which seems to be new and still in the early stages at the time this dissertation is supposed to be submitted; in recent works (Singh *et al.*, 2010) Curcumin (*Curcuma* spp. Contain curcuminoids including Curcumin; Curcuminoids can be defined as phenolic compounds derived from the roots of *Curcuma* spp. (See chapter 1) has been identified as inhibitor of HIV-1 LTR directed gene expression and viral replication. These studies have shown that Curcumin is a pharmacologically safe compound, and is able to block HIV replication by inhibiting HIV-integrase and protease (Singh *et al.* 2010).