5 SUMARY

It is important to understand how *B. subtilis* grows in harsh conditions to demonstrate the probability of microbial growth in low O_2 conditions, even in anoxia and low atmospheric pressure. In this study we used three strains of *B.subtilis* where two expressed the gene *vgb* of *Vitreoscilla stercoraria* using plasmids pUB110::*sspE::vgb* (multicopy), *pTrp::vgb* (with one integrative copy) which affects the growth of *B . subtilis* and a third one wild-type. Strains were inoculated in nephelometric flasks with 2xYT medium. Bacterial growth of the three strains of *B.subtilis* was measured by the absorbance values obtained from a SPECTRONIC 20D + spectrophotometer (Milton Roy) at 37 ° C in five conditions: aerobic, microaerophilic, vacuum, anaerobiosis and anaerobiosis + vacuum. The strains grew in all different conditions however, the best growth was observed from the aerobic and microaerophilic conditions. The strain with plasmid pUB110:: *sspE::vgb* (multicopy) increased in greater proportion in the vacuum conditions and in anaerobiosis. The wild type strain with the plasmid pUB110:: *sspE::vgb* had a better growth with less *lag* phase in the absence of oxygen. However, the strain with the plasmid *pTrp: vgb* grew poorly, probably due to fact that when this plasmid becomes integrated in the bacterial chromosome, disrupts the gene for starch utilization, affecting in some way growth and development. Growth rate (k), generation time (g) and statistics analysis where corroborated in the logarithmic phase of each bacterial growth curve. We conclude that since *B.subtilis* can growth under extreme environmental situations, including anoxic conditions, could offer the possibility to be used as a starter to colonize neighbor planets in our solar system with low atmospheric pressures provided that necessary nutrients are provided. Additionally, recent evidence of water in Mars suggests that this could be a possibility in the next decades.