

## CHAPTER 7

### CONCLUSION

From the first experiment, there were 3 isolates, *Azospirillum* 2 (VAs 2), *Beijerinckia* 75 (VBe 75), and actinomycetes 77 (VAc 77) that had the highest values for shoot dry weight of Chinese kale. The use of single and multiple inoculations of these highest performing isolates increased the uptake of all nutrients (nitrogen, phosphorus, potassium, calcium and magnesium) in Chinese kale seedlings, especially the multiple microbial inoculation. For the single inoculations actinomycetes VAc 77 showed the highest root dry weight and also significantly increased the uptake of nutrients compared to control.

The effect of seedling media with leonardite (high humus material) and single microbial inoculation on growth and nutrients uptake in Chinese kale seedlings was studied, Seedling media with 15% leonardite and actinomycetes (VAc 77) gave the highest root and shoot dry weight. This treatment increased vitamin C content and antioxidant activity at both 20 and 40 days after inoculation. Growth parameters and nutrient uptake of Chinese kale seedlings were improved by microbial and leonardite application. Our results suggest that good growth and high nutrient uptake in the seedlings would therefore ensure good performance and high quality vegetables after transplanting.

In conclusion, these experiments indicated that when selected seedling media (SSM) was mixed with actinomycetes 77 (VAc 77) plus 15% leonardite, the mixed media was able to promote the vitamin C content and antioxidant activity. In addition, actinomycetes 77 (VAc 77) was identified using 16S rDNA sequencing. This isolate showed high homology with the sequence of *Streptomyces variabilis* with an overall 99.48% similarity. Our results suggest that high humus materials and beneficial microorganisms will be useful in producing high quality vegetables after transplanting.