



























































































































































































During this study we observed that the adult beetle's gut selected for specific yeast species that also occurred on the leaves. However, we isolated different yeast species from the larvae. Thus, interesting questions that need to be addressed in future studies are: Does a shift occur in the yeast community and, what is the the effects of such a potential shift on the beetle's ontogeny?

#### **4.3 *B. coddii* and *C. clathrata*: a model system for adaptation and co-evolutionary studies?**

*Berkheya coddii*, *C. clathrata* and their associated microorganisms are potentially excellent candidates to be used as a model system for adaptation and co-evolutionary studies due to various factors. Firstly, this plant and beetle can be reared with relative ease in the laboratory and large experimental groups can be established. Secondly, the presence of high Ni concentrations in this food web serves as an easily observable and manipulable selective agent. Thirdly, the physiological adaptations of *B. coddii* and *C. clathrata* enabling them to cope with high Ni concentrations have already been elucidated by others allowing us to observe any changes in these physiological structures/mechanisms during experiments. Lastly, there are culturable microorganisms associated with the plant and beetle allowing us to manipulate the interactions of the microorganisms with *B. coddii* and *C. clathrata*.

#### **4.4 In conclusion**

We found a variety of culturable endo- and epiphytic microorganisms associated with leaves of the Ni hyperaccumulator *B. coddii*. We also discovered a number of Ni resistant yeast strains, representing different species, in the faeces of *C. clathrata*, an insect herbivore of *B. coddii*. In addition, our preliminary experiments indicated that these yeasts may be in a syntrophic relationship with *C. clathrata* and, by being able to sequester Ni, the yeasts may contribute to reducing the toxicity of Ni to this insect. However, many studies are still needed to fully understand the symbioses between *B. coddii*, *C. clathrata* and nickel (Ni) resistant microorganisms.