

Investigating rare microbial communities of the Nullarbor Plain

P. Waterworth^{1,2}, D. Buckley², T. Brockhouse², P. Streit², B. Bulled²

¹ School of Sports Science, Exercise and Health, The University of Western Australia

² Australian Speleological Federation

The Nullarbor Plain is located in the South-West of Australia and forms the onshore region of the Eucla basin, one of the world's largest karst areas. The region contains many flooded features, filled with brackish water; however, relatively few of the flooded caves have been explored and even fewer have been the subject of published, aquatic ecological investigations. Observations made during previous phylogenetic research indicated the microbial communities found within the caves, may have limited re-growth and be vulnerable to disturbance by cave diving activities. In response to this anecdotal information, a systematic study commenced in 2010 and is centred on the microbial communities of 5 Nullarbor caves (Murra El Elevyn, Warbla, Weebubbie, Olwolgin and Burnabbie). The study includes growth, spatial distribution and photographing unique forms of the bacterial communities within the caves. Growth is being investigated by obtaining regular measurements from 9 sites within Murra El Elevyn cave and also from 10 sites within Warbla cave. Murra El Elevyn is a popular dive site, whereas Warbla is a reference cave and therefore is not subjected to the same level of visitation by divers. Along with obtaining growth information, it is anticipated the comparison of data from these caves will provide insight into the effect of diving upon bacterial growth. Spatial distribution patterns are being identified by using modified quadrat and visual counting methods. Although the bacterial communities have two generic forms, a hanging mantle and a supine mat form, it has become evident that there is a considerable amount of variation within these broad types. A unique mantle form observed within Olwolgin cave, appears to have a central core within a gelatinous outer coat, giving the impression that it is not a bacterial community - when in fact, it is. These communities are no more than 15 cm in length and are quite small in diameter. Several mat communities within Burnabbie cave have developed in a conical shape because they are growing upon a conically shaped silt pile. However, it is not evident why the silt or the bacteria have assumed this shape. The ongoing cataloguing of unique features will continue in conjunction with growth and distribution investigations until mid-2013, when the data will be analysed and the results published.