Unknown microbiology report assignment

The purpose of the following study is to determine where the two unknown bacteria acquired in Microbiology lab should be classified in regards to temperature, pH level, and osmoregularity. It is important to classify bacteria in order to identify them. Identification of bacteria is important because they are not only useful but potentially dangerous as well. The identification of bacteria can lead to breakthroughs in healthcare regarding treatment of old and new diseases alike.

Identifying bacteria can also be used in many other areas from better crop production through microbial pesticides to biological warfare. Their uses are endless as are their abilities to evolve and adapt to changing environments. That is why it is so important to be able to identify microorganisms. This study was conducted using techniques and experiments learned in microbiology lab that were used to classify the two unknown bacteria. The two unknown bacteria were presented in a broth culture labeled unknown #15 by Connie and Desiree.

The ubiquity came from a swab of the cold room used for Microbiology Lab located in Life Sciences East. Techniques such as the quadrant streak and proper use of an inoculating loop learned in class were used in this study. All procedures, unless otherwise noted, have been followed and performed exactly as stated in the laboratory manual Leboffe & Pierce(1). Using the Quadrant Streak technique the unknown and ubiquity were streaked onto a trypticase soy agar (TSA) plate. This method was performed as stated in the Leboffe & Pierce lab manual(1).

The TSA plates were incubated at 30 degrees Celsius for 48 hours. This process was repeated until isolated colonies appeared. At this point cell morphology was observed and recorded. At this time the unknowns were renamed as Unknown Red (UK-R) and Unknown White (UK-W) because the pigment production was a deep red for one and a cream colored white for the other. The ubiquity was also renamed at this time as Ubiquity #1 (UB-1). Each organism was placed on a series of agar plates using an inoculating loop for each test.

For the temperature test each bacteria was placed on a nutrient agar and incubated for either 10, 20, 30, 40, or 50 degrees Celsius for 48 hours. During the pH test, each organism was placed on four agars varying in pH level from pH 2, 4, 6 and 8 and incubated near 37 degrees Celsius for 48 hours. For the osmotic pressure test, each organism was placed on four agars one each containing 2%, 5%, 8%, and 11% NaCl concentration levels. These were incubated near 37 degrees Celsius for 48 hours. The results of the tests are recorded in Tables 1, 2, and 3.

All tests were performed according to the instructions provided in Leboffe & Pierce(1). The biochemical tests used on both unknowns and the ubiquity are: 1. Temperature 2. Osmolarity 3. pH Results: Table 1The Effect of Temperature on Microbial Growth Organism10 degrees Celsius20 degrees Celsius30 degrees Celsius40 degrees Celsius50 degrees CelsiusClassification Uninoculated CultureNGNGNGNGNG UK-R1674NGMesophile UK-W15642Mesophile UB-14453NGMesophile Table 2The Effect of pH on Microbial Growth OrganismpH 4pH 6pH 8ph 10Classification Uninoculated CultureNGNGNGNG

UK-R4784Neutrophile UK-W4684Neutrophile UB-11253Neutrophile Table 3The Effect of Osmotic Pressure on Microbial Growth Organism2%5%8%11%Classification Uninoculated CultureNGNGNGNG UK-R4330Non-halophile UK-W4210Non-halophile UB-14732Halophile *NG- No Growth **The optimum temperature, pH level, and osmotic pressure is bolded in each table. After these tests were performed, it was possible to classify UK-R and UK-W as mesophiles, neutrophiles, and non-halophiles. While UB-1 was also a mesophile and neutrophile, the tests showed that UB-1 was a halophile as well.

In the performed tests all results have been viable and without any contamination as a control uninoculated TSA plate was used for each one. A list of possible bacteria was presented by the TA. As of right now the only possible conclusions are that neither unknown or ubiquity is Thermus and Halomonas because Thermus is a thermophile while both unknowns and the ubiquity are mesophiles and Halomonas is an extreme halophile while none of the bacteria can survive at high NaCl concentrations.

To positively identify UK-R and UK-W more tests will be performed, but through these tests the first step has been achieved and that is classification . To date there is still not enough information to positively identify either species. Further testing is in progress and will narrow these results further until both unkowns can be identified. (2) References: 1. Leboffe, Michael J. Microbiology Laboratory Theory and Application. 2nd edition. Morton Publishing Company, 2006 2. Bergey’s Manual of Determinative Bacteriology, 9th ed. Edited by John G. Holt et al. Baltimore: Williams & Wilkins, 1994.