Mlt1 task 11

Health & Medicine

Clinical Microbiology Laboratory Number A Microbial life in most instances (uncontrolled environments) is ubiquitous and found in the soil, air, water, human skin, gut of animals and human beings, vaginal flora, and even in extreme environments (Prescott & Harley, 2005), as I partly discovered in my laboratory endeavors.

B

Microbes play a myriad of various functions in our ecosystems. According to Toy (2008), these roles include, among others, protection against infection such as by providing a healthy counter-active microbial flora, aiding decomposition and soil enrichment, processing of foods and beverages such as of fermented milk, wine, alcohol, yoghurt, sauerkraut, and so on, aids in agricultural production through nitrogen fixation, for example, are useful inn study and manipulation of the DNA of plants and animals (genetic engineering/ biotechnology), and in the development of vaccines.

C

In all the samples that I studied, that is, those from water, soil, and air, there were evidences of microbial growth after allowed periods of incubation in the respective Petri-dishes at room temperature. However, also, there were no distinct colony characteristics in all the dishes which had various kinds of colonies, colors, shapes and other such definitive features. Five kinds of colonies were evident on the air dish and had various sizes (6mm, 4mm, 13mm, 5mm and 9. 5mm) and shapes (with four being irregular and one round shaped). Margins were either lobate (2) or wavy (3) with the surfaces wrinkled, smooth or smooth with contoured edges. The first colony was milky white, the second had a white center with clear surrounding, the third had a white center with milky white surrounding, the fourth had yellow, gold, clear

surrounding and the fifth had a tan center with a white/ clear ring.

Two colonies were seen in the soil (one 10mm and the other less than 1 mm in size). The first colony lacked a definite shape or margin while the second was irregularly shaped with a lobate margin. All surfaces were wrinkled. The first colony was clear and the second was cream white. There were four different colonies in the water sample (dish) (4mm, 5mm, 1mm, and 30mm). Three were round and one irregular, with two margins lobate and the other two smooth. All surfaces of the water colonies were smooth. Colors differed from tan to white, orange, clear to off white and lastly, transparent.

D

As noted in C above, all the dishes from water, air, soil and skin samples had an array of different kinds of microbial colonies. This is a result of the fact that each of these microbial environments contains different kinds of microbes that consequently manifested themselves in the differences observed in respective dishes. The environments were ‘ contaminated’ with a number of different microbes and so observing just a single colony type was made difficult. Serial isolation of these colonies can however result in pure cultures (Bauman & Masuoka, 2004). The air dish had the most number of colonies (5) followed by the water dish (4) and lastly the soil dish (2). Air has the highest number of microbes followed by water. Soil has the least number of microbes of the three studied environments, as was seen in the number of colonies formed in the respective dishes.

E

Adaptability of microbes increases transmission of diseases. Microbes are highly adaptable to alterations in their environments. Some of these adaptations in microbes can be reversible, especially when the

environmental change has been lifted, while other changes are permanent and thus, hereditary. This adaptability can sometimes be called resistance or tolerance and the mechanisms behind the same are plenteous. Adaptability allows the microbe to withstand gruesome conditions (such as presence of antibiotics) and replicate nonetheless, while also ensuring future generations of the microbe are imparted with this adaptation/ tolerance (Prescott & Harley, 2005). This therefore, needless to add, considerably aids disease transmission. This phenomenon is continuously exampled in Mycobacterium tuberculosis which is a pathogen that causes tuberculosis, even in its most resistant, infectious and violent forms, with conventional antibiotic regimes growing increasingly apathetic to its presence (posing a great threat to the human population hence) (Baker & Nicklin, 2011).

References

Baker, S., & Nicklin, J. (2011). Microbiology (4th ed.). New York: Garland Science.

Bauman, R., & Masuoka, E. (2004). Microbiology. San Francisco: Pearson/Benjamin Cummings.

Prescott, L., & Harley, J. (2005). Microbiology (6th ed.). Dubuque, IA: McGraw-Hill Higher Education.

Toy, E. (2008). Microbiology (2nd ed.). New York: McGraw-Hill Medical.