An Experimental Design for Demonstrating Succession

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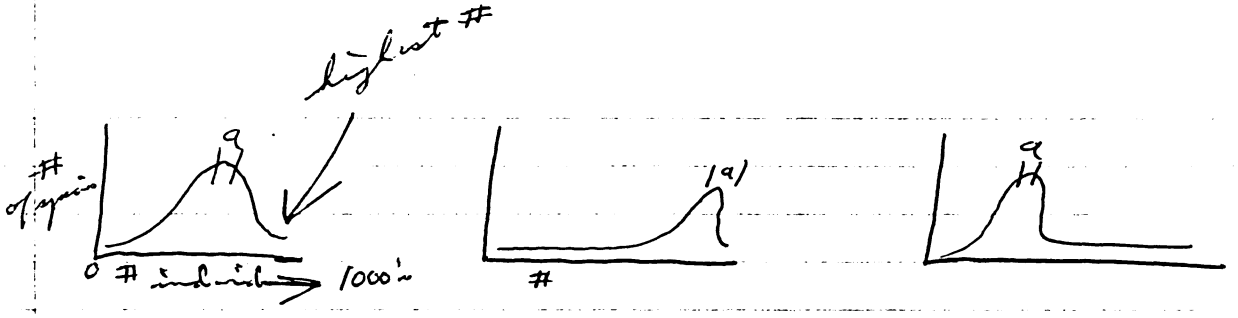
It is maintained that the protozoa in a given population are selected for by such factors as temperature, acidity, established organismal complexes, metabolic products in the enviroment, etc. It is also postulated that each population is constantly seeded with air-borne protozoan trophozoites and cysts. Most of them find the enviroment unfavorable and either never develop or die. Thus, they are not seen upon a differential count.

If one could think of the protozoa in a population as consisting of a universe with a bell-shaped curve, one could appreciate the fact that the organisms most likely to be detected would be centered about the center of the curve. As the culture ages and different metabolic products, etc. are put into the enviroment the curve will become skewed to either the right or left giving new areas of detectability

NO
This is intended or part of the way



a = Range of detectability

The purpose of this experimental design is to either prove or disprove this succession theory.

MATERIALS and METHODS

Two bodies of water (Bogs, Ponds, etc) are selected that have a similar Ph, O_2 content, CO_2 density, etc.. The organisms from one population are filtered out using a 0.47μ millipore filter and are replaced by organisms from the other population. Thus, 400 cc of filtered water from pond #1 are mixed with 400 cc of non-filtered water from pond #2, and vice versa.

Below is an outline of the experimental design and its controls. Four-hundred cc of each half of the combination

used so that the final volume used in each container ~~is~~ 800 cc.

1 SALINE + ⊛ POND#2
2 ⊛ POND#1 + SALINE
3 ⊛ POND#2
4 ⊛ POND#1 + ⊛ POND#2
5 POND#1 + ⊛ POND#2 (EXPERIMENT)
6 ⊛ POND#1

⊛ = NON-FILTERED

The containers are kept together in the same environment and allowed to remain undisturbed for two days. Thus, any changes will be caused by the sudden changes in environmental factors rather than normal succession. Each container is examined on a microscope slide for 15 minutes and a differential count established. Large rectangular coverslips should be used so that one can get a more representative sample. In 15 minutes one should expect to find only the most frequently found organisms which is more than sufficient in this

design. Population counts should be made using a counting chamber and wipple eyepiece. The organisms in my attempts were allowed to settle 15 minutes before counting. Ph, O_2 density, and CO_2 density were ~~maintained~~ recorded using the HACH HACK KIT.

DISCUSSION

If there is succession and the whole experimental design itself itself is changing at the same pace, we can use controls #3 and #6 as monitors. Controls #1 and #2 determine if dilution factors are involved. Control #4 is designed to help one detect whether or not a real change has occurred and #5 is the experiment itself.

When the experiment is conducted on pond II ~~data~~ parts #3 and 5 will be as follows

3 ⊛ Pond #1
5 Pond #2 + ⊛ POND #1

If the theory of succession is valid the following results would be expected

A) SALINE + ⊛POND#2 = * POND #2
B) SALINE + ⊛POND#1 = * POND #1

C) A ≠ B

D) POND#1 + ⊛POND#2 ≠ ⊛POND#1 + ⊛POND#2

≠ * POND #1

E) POND#1 + ⊛ POND#2 ≡ ⊛POND#1