

PROJECT 1-3

ISOLATION OF FUNGI FROM SOIL

PROBLEM

Can you isolate soil fungi and compare the frequency of different fungi from various types of soil?

INFORMATION

1. Many fungi occur in soil. Some are saprophytic on animal and plant remains, others are plant parasites. A few trap and digest soil nematodes (see Project 1-4) and other soil animals. In turn, the fungi are eaten by soil animals like springtails and mites.
2. The problem in isolating soil fungi is that they have a vast array of food preferences, pH optima, temperature preferences etc. but in the Petri dish you only provide one environment that will favour those fungi that grow well under those conditions. Your comparisons between different soil types will therefore not be of the total soil fungal flora, but of those members of the flora that happen to grow well under your isolation conditions.
3. Methods for sterile techniques and making agar plates are given in Section G.
4. Two methods of culture are suggested:
 - a) Using sterile forceps place a crumb of soil into a sterile Petri dish. Add molten sterile agar (malt and potato-dextrose agar are particularly good) and swirl the plate gently. Incubate at room temperature in the light for several days.
 - b) Make a soil suspension in sterile water, and add different dilutions to warm (about 50C) sterile agar, pour into sterile Petri dishes and incubate at room temperature in the light for several days. This method can be developed to calculate number of fungi per g of soil. The numbers of bacteria in soil can also be estimated in the same way.The type of fungi isolated from soil depend on the method used. Those which spore profusely and grow rapidly are more likely to be isolated by method (b), whilst slower growing, non-sporing fungi can occasionally be isolated by method (a).

DESIGN OF EXPERIMENT

1. How will you check that the fungi you grow are actually from the soil and not from faults in your sterile technique?
2. If you are hoping to estimate the number of fungi per gram of soil, at what stage will you weigh your sample? (You will use a lot less than 1 g)
3. Are you going to sample soil from the same place at different times of the year, at different depths, or from a sequence of places along a transect, say from beach through sand dunes into forest, or from burned to unburned areas of bush?

REFERENCES

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