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HOW TO ENUMERATE AIRBORNE MICROORGANISMS?

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Bacterial enumeration of environmental samples may in some cases be a difficult task. Typically, in seawater and soil samples less than 1% of assumed alive bacteria are easily cultured on agar plates. It is difficult to see any reason why airborne bacteria should be more easily cultured. The question then arrives: how to enumerate airborne bacteria? We collected air samples using a XMX-CV collector (Dycor) as well as rain samples. The samples were then analysed using different methods to enumerate bacterial concentrations: Flow cytometry (FCM), Quantitative PCR (Q-PCR), Epi-fluorescense microscopy (EFM) and agar plating. In general FCM and Q-PCR yielded results in the same order of magnitude. In air samples it was difficult to discriminate between bacteria and background noise using EFM as the bacterial concentration in general was low compared to other environmental samples. Around 1% of the bacteria counted by FCM and and Q-PCR grew on agar plates. The next question then arrives: Are these bacteria alive? We incubated rain samples with radioactive leucine in order to measure bacterial activity. The cell-specific bacterial activity was shown to be comparable with typical sea water samples. In general airborne/rainborne bacteria may be enumerated using FCM, Q-PCR and in some cases EFM. Updated results will be presented.