

Microbial Air Samplers

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Abstract:

The subject of inhaled bacteria is among the famous topic of current research. A precise bio-impactor with high resolution and fast response time is a must to measure and identify these airborne bacteria.

It is to be noted that Stewart studied in 1995 the shock and the stress effect on the aspired microbes at the velocity from 24 to 250 m/s. The highest recovered rate of viable cells obtained at a speed of 40 m/s for *Pseudomonas*, whereas the aspiration speed of *Micrococcus* was around 24m/s. This study shows the impact of aspiration speed parameter on the collection process.

Most used bio-impactors for indoor air measurement of hospitals and clean rooms are not equipped with adjustable parameters. The need of new equipment with adjustable parameters as aspiration speed, cut diameter and nozzle is a must for research.

The construction of a modern bio-impactor device with adjustable parameters is our objective in this study. The study of the effectiveness of this new constructed device is a necessity. For this purpose, measures were conducted on the physical measurements collection as well as the viability losses of microorganism during sampling (stress, impaction and dehydration).

The new bio-impactor device constructed with adjustable nozzle diameter as well as speed is of remarkable originality. The concept of this new bio-impactor device is based on a rich literature of several authors such as Hinds (1999), Nevalainen et al (1992) and Miss Marple and Willeke (1976).

Many experimental measurements have been carried out on several locations as (hospitals, clinics, laboratories, clean room and white room) to control the interior air quality of bacteria and to test the efficiency of our instrument. The comparison of measures collected by our device and the commercial bio-impactor is a requirement.

Indeed, the collection efficiency with our modern bio-impactor was of 24 to 99% for finding viable particles in indoor air. For identical sampling points, we obtained a collection more efficient with the modern bio-impactor around 25 to 65%. This study clearly shows the importance of adjustable parameters in a bacteriological analysis.