

The hitchhike' s guide to bacterial transport: the role of viable dust-borne microbes deposition into marine environments

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Aerosols and dust are regularly transported across the oceans and seas supplying nutrients and trace metals to the surface water. In addition, aerosols may also contain a wide array of different airborne microorganisms (heterotrophic bacteria, virus, cyanobacteria and fungi), that can be easily transported for thousands of kilometers away from their place of origin within a few days. The southeastern Mediterranean Sea (SEMS) and the northern Red Sea (NRS) are ideal marine environments to study the role of aerosols and airborne microbes on surface microbial production for multiple reasons. First, both environments are subjected to relatively high aerosol deposition throughout the year. Secondly, they are oligotrophic environment with low inorganic nutrients and low autotrophic and heterotrophic activity for most months. Thus, any external input of micro/macronutrients, along with airborne microbes, can have a relatively substantial effect upon interaction with the ambient microbial populations; thereby having a potentially large effect on the system' s production and ecological function. Here, we will discuss who are the dominant airborne bacteria that are being transported to the SEMS/NRS during storm events. Further, we will present some of the ecological roles these microorganisms hold (carbon and nitrogen fixation) and how airborne microbes interact with ambient microbial populations. These results demonstrate that dust-borne microorganisms may play a significant role marine environments.

Keywords: Airborne microbes, Desert dust, Aerosols, Microbial interactions