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Global warming impact on airborne microorganisms may threaten health and food security

A landmark study analysing the atmosphere from ground level to 3,500 metres has linked rising temperatures to changes in fungi and bacteria that could destabilise ecosystems and exacerbate illnesses.

Conducted by the Singapore Centre for Environmental Life Sciences and Engineering (SCELSE) at Nanyang Technological University, researchers used a 200-metre meteorological tower and research aircraft circling at altitudes of 300metres and above. After the analysis, it became clear that air temperatures were the most significant factor influencing the composition of airborne microbial communities.

As heat levels change, species that exist in this section of the atmosphere – known as the microbiome – also change, meaning the current trend of global warming will almost certainly have an impact on these lifeforms. Crucially, this has raised a warning that as these organisms change, the small number that make their way back to Earth – for example attached to sand grains or as rain droplets – could impact terrestrial and aquatic ecosystems.

‘If the composition of the air microbiome changes globally, it may affect human health, exacerbating respiratory syndromes in susceptible patients, or it could affect the yield of agricultural crops, which then threatens our food security. Natural processes that have worked for thousands of years such as carbon cycling of this planet may also be changed,’ said Professor Stephan Schuster, Research Director, team lead, and the study’s corresponding author.