People breathe in up to 1 million bugs a day, study finds

Researchers say the micro-organisms can affect those with respiratory problems

With every breath you take, every move you make, you are inhaling tens of thousands of micro-organisms which will not affect healthy people, but can have an effect on those with respiratory illnesses. Scientists here have conducted the first study of the atmosphere undertaken in the tropical region to understand what we inhale and how it possibly impacts us.

A team of researchers from the Singapore Centre for Environmental Life Sciences Engineering (SCGELSE) at Nanyang Technological University (NTU) found that, on average, humans breathe in between 100,000 and one million micro-organisms of more than 1,000 different types a day, with at least 726 species of them constantly present in the air around us. These microscopic living things cannot be seen by the naked eye and include bacteria and fungi, which dominate the atmosphere in abundance at different times of the day.

The team said that microbial communities in the atmosphere have an effect on environmental and human health, with the most immediate impact on patients with respiratory illnesses. Professor Stephan Schuster, research director at SCGELSE and geonomics professor at NTU, said: “What we already know is that healthy people are unaffected. But, at the same time, it is clear that people who have respiratory problems — they seem to respond to the organisms in the air.”

On average, humans breathe in 11 cubic m, or 11,000 litres, of air daily.

Depending on the environment they are in, the air they breathe in could contain 50,000 organism cells in the tropics during the day, but 30 to 100 times that number at night.

Some who are jogging at night will breathe in, on average, 100 times more micro-organisms than if they were to jog at noon.

Three species of bacteria were used to form the word “air”, while the other petri dishes contain fungi grown from the air samples collected by the research team.

Singapore Centre for Environmental Life Sciences Engineering research director Stephan Schuster with air sample collectors and his team of researchers who worked on the study of the atmosphere in the tropical region to understand what we inhale and how it can impact us. PHOTOS: NANYANG TECHNOLOGICAL UNIVERSITY

Vanessa Li

Singapore is the only country in the world to have a complete map of airborne organisms, said Prof Schuster.

He added that understanding the dynamics of bioaerosols — or airborne micro-organisms — will help in managing indoor air quality.

“When one cooks the air inside a room very rapidly, such as with the use of air-conditioning, it can lead to condensation of water on surfaces, a pre-condition for mould and fungal growth,” he said.

In the long term, people could suffer from the organic compounds and spores that are released into the air from this mould, he said, noting that proper ventilation and monitoring the relative humidity of a room are important in preventing fungal growth.

At the moment, the researchers are working with NTU’s Lee Kong Chian School of Medicine to look at how bioaerosols affect patients with bronchitis, chronic obstructive pulmonary disease and severe asthma.

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