

Beautiful Science



While there are studies on the impact of haze on human well-being, its effect on other species and ecosystems is rarely explored.

A study led by Associate Professor Antonia Monteiro from the Department of Biological Sciences at the National University of Singapore's Faculty of Science has revealed that toxic chemicals in haze can affect the survival and development of butterflies, said the university.

Insects are very sensitive to changes in air quality because air reaches their inner cells directly through valve-like openings known as spiracles on the sides of their bodies. The diffusion of gases then takes place close to each cell via very fine tracheal tubes that transport the air from the spiracles to the inside of the body. In humans, the air first diffuses into the blood system in the lungs before reaching cells.

The researchers discovered that when the caterpillars of the Squinting Bush Brown Butterfly (*Bicyclus anynana*) were exposed to artificially generated smoke from burning incense coils, a large proportion did not survive to adulthood. Those that did survive took longer to reach adulthood, and were smaller. A smaller size usually leads to lower egg production.

These findings provide insight into the adverse effects of haze smoke on insects, said NUS. As butterflies are easy to identify and monitor, they could be used as bioindicators of the health of an ecosystem for better haze management, the researchers believe.

Here, the image above shows a caterpillar of the Squinting Bush Brown Butterfly and the image on the right is a magnified view of its spiracle openings. PHOTOS: NATIONAL UNIVERSITY OF SINGAPORE

