Unique breathing cycles may be an important defense for insects

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Insects exhibit breathing patterns called discontinuous gas-exchange cycles that include periods of little to no release of carbon dioxide to the environment. Researchers who studied the respiratory patterns of 15 species of ground beetles found that these cycles may minimize the risk of infestation of an insect's tracheal system by mites and other pathogens.

The findings may help provide a more comprehensive understanding of why insects have an evolutionary advantage over other animals.

"The tracheal system of insects facilitates gas exchange through direct contact of cells with air—without the need for additional oxygen-carrying molecules—and is one likely explanation for evolutionary success of insects; however, such direct respiration may also require a specific protection through effective closing mechanisms at the terminal ends of the tracheal system to keep out things you typically don't want in your respiration tract," said Dr. Ulf Bauchinger, senior author of the *Evolution* study.

More information: Agnieszka Gudowska et al. Hold your breath beetle-Mites!, *Evolution* (2015). DOI: 10.1111/evo.12827

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