# Indoor climbing gyms found to have pollution levels comparable to major city roads



Indoor rock climbers may be inhaling potentially harmful chemicals emitted from the rubber soles of their footwear, according to a scientific study conducted by researchers at the University of Vienna. The study found that these toxic chemicals are released into the air within climbing gyms and subsequently breathed in by climbers and staff, raising concerns over possible health risks associated with such exposure.

The research team collected air samples from five climbing gyms in Vienna, as well as four additional gyms located in France, Spain, and Switzerland. Using an impinger—a device designed to simulate human lung exposure to pollutants—they measured the concentration of airborne chemicals linked to the rubber soles of climbing shoes. Their findings revealed that the levels of these chemicals in indoor climbing environments were comparable to those measured in some of the world's most polluted urban areas, particularly multi-lane roads in large cities in China.

Joint author Anya Sherman, an environmental scientist involved in the study, described a familiar sight to many climbers: "Climbers wipe [the black residue] off to get a better grip, and it gets kicked up into the air." The residue, originating from shoe soles, contains chemical additives similar to those used in car tyres to enhance grip and durability. These substances include 6PPD-quinone, which has been linked in animal studies to lung inflammation, scarring, and widespread organ damage, and benzothiazole, associated with heightened risks of bladder cancer among factory workers.

Fellow researcher Professor Thilo Hofmann highlighted the severity of the measured pollution levels, stating that "The levels we measured are among the highest ever documented worldwide, comparable to multi-lane roads in mega-cities." He emphasised that the long-term health effects of chronic exposure to these chemicals in climbing gyms remain unclear and that further research is required, particularly concerning sensitive populations such as children. "It makes sense to act before we know all the details about the risks," Professor Hofmann added, urging the climbing industry to seek alternative materials for shoe soles with fewer harmful substances to protect both gym attendees and staff.

Given the rising popularity of indoor rock climbing, also known as bouldering—where participants climb walls without harnesses or ropes—the findings have gained wider attention. The sport has seen rapid growth in recent years, with numerous facilities opening across major UK cities and internationally. Celebrities such as actor Jason Momoa, known for his role in Aquaman, are among those who have embraced the activity, further boosting its profile.

While awaiting material innovations, Ms Sherman suggested climbers consider exercising during less crowded times to reduce exposure to airborne pollutants, as peak gym usage may elevate levels of these harmful particles.

The study, published in the journal Environmental Science and Technology Air, provides new insight into an unanticipated environmental health hazard within indoor climbing gyms and calls for measures to address air quality and material safety in this expanding sport.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

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