# Study finds lighting wavelength influences indoor mould growth



A recent study conducted by researchers at University College London has explored the impact of different lighting wavelengths on the growth of common indoor mould species found in UK homes, with findings that could influence future building design and indoor air quality management.

The research, led by Ella Hetherington and colleagues from the Advanced Centre for Biochemical Engineering, Department of Biochemical Engineering at UCL, investigated how long-wavelength (650-700 nm) and short-wavelength (435-465 nm) LED lighting affected the development of Aspergillus niger and Cladosporium sphaerospermum under controlled laboratory conditions. These two mould species are commonly identified in indoor environments and are known to compromise building integrity and air quality.

Cultures of the mould were incubated continuously under these lighting conditions as well as in darkness, at two levels of water activity (aw 0.95 and aw 0.91), which simulate varied moisture conditions commonly encountered in buildings. The study measured mycelial growth by colony diameter and dry cell weight, and quantified spore production using a hemacytometer.

Key findings revealed that for Aspergillus niger, exposure to long-wavelength light significantly promoted both mycelial growth and spore (conidia) production at both tested water activities. In contrast, short-wavelength light resulted in the lowest spore production, indicating a potential inhibitory effect on mould reproduction. Cladosporium sphaerospermum also showed increased spore production under long-wavelength light; however, enhanced mycelial growth was observed only at the higher water activity level.

The study suggests that using spectrally optimised lighting systems could serve as a sustainable, non-chemical strategy to control mould growth in buildings, potentially reducing reliance on humidity control alone. Hetherington and her team concluded that such lighting interventions could create environments less conducive to mould, thereby improving indoor environmental quality.

Regarding future research directions, the authors recommend further investigation into broad-spectrum lighting encompassing a wider range of wavelengths to determine the most effective spectral profiles for mould prevention in the built environment.

The full research article is set to be published soon in the journal Frontiers. This study was received on 29 March 2025 and accepted on 28 April 2025. The work is openly accessible under the Creative Commons Attribution License.

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## Bibliography

1. <https://www.ucl.ac.uk/epicentre/research/understanding-risk-and-behaviours-individuals/mould-growth-testing-and-benchmarking> - Supports UCL's research focus on mould growth in residential properties, aligning with studies on environmental factors affecting mould development.
2. <https://discovery.ucl.ac.uk/id/eprint/10163118/1/MC2022_Chen_Borui.pdf> - Details UCL research on how indoor light conditions (including spectral properties) affect Aspergillus versicolor growth and sporulation, corroborating the wavelength-dependent effects described in the query.
3. <https://journals.uclpress.co.uk/ucloe/article/id/709/> - Provides methodology for studying mould growth under building-specific conditions (moisture, ventilation), relevant to the water activity parameters described in the query.
4. <https://journals.uclpress.co.uk/ucloe/article/709/galley/12323/view/> - Identifies Aspergillus spp. as predominant indoor mould genera, consistent with the focus on Aspergillus niger in the described research.
5. <https://ukcmb.org/our-work/research-led-knowledge-transfer/benchmarking-fungal-levels/> - Demonstrates UCL-affiliated efforts to standardize mould assessment protocols, relevant to the experimental methodologies in the query.
6. <https://www.ucl.ac.uk/epicentre> - UCL EPICentre’s broader research context for built environment studies, supporting the institutional framework for the described mould research.
7. <https://news.google.com/rss/articles/CBMimwFBVV95cUxOX3JSWlVnYzl4WFJKaVptOVNUNXk5a3RnZWgzWE5LU09LRzVlelhSMUtkTWI3MnVEdlJBWVRWcFdMWTB5ZWViV3ZBMXZvTElCUDc4Tm9QaFd6MVMtUnIyd0pJdmswUi1KWHE2Z3h6ZjhkaVVGMmpyajRxaTlTV1B4WDJGZjhkQ19GTzZVT3BNWkZUVjZlMktpRVEzcw?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data