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Physiological responses of spearmint to radon exposure

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Abstract

Radon, a naturally occurring radioactive gas, is the second leading cause of lung cancer among non-smokers. Its effects on living organisms remain a critical area of study. This research investigates how high radon concentrations influence Mentha spicata L. (MS), commonly known as spearmint, a medicinal plant valued for its bioactive compounds. Plants in chamber A were exposed to radon, whilst those in chamber B served as controls. Using HPLC-DAD, we analysed 21 bioactive compounds, including phenols and flavonoids, to assess metabolic alterations. Results indicated that the total ratio of compound production/consumption in radon-exposed MS was nearly twice that of the controls, suggesting a stress-induced metabolic response. However, individual compounds exhibited varied trends—some increased proportionally with radon concentration, while others remained unchanged or declined. This may reflect radon-induced disruption of metabolic pathways or accelerated synthesis of protective metabolites. Given that these compounds contribute to plant defence and medicinal properties, radon exposure could influence the bioactivity of MS. Understanding how environmental stressors affect MS provides valuable insights into plant adaptation and potential impacts on human health. These findings contribute to research on radon's biological effects and strategies to mitigate its impact on ecosystems and medicinal plants.

Keywords: *radon exposure, bioactive compounds, oxidative stress, medicinal plants, health*

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