Detecting Perfluoroalkyl Chemicals in Heuchera Utilizing Infrared Spectroscopy

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PFAS chemicals, or perfluorinated substances, are commonly found in household products, like non-stick cookware, waterproof materials, and fabrics. PFAS, or perfluorinated substances, are commonly found in firefighting foam. If leaf samples from Heuchera plants (Coral Bells) are analysed using infrared spectroscopy, then PFAS chemicals will be detectable in the samples. Most PFAS found in plant samples have been found using LC-MS or Liquid chromatography-mass spectrometry. This study introduces a novel approach to detection by enabling researchers to use Infrared spectroscopy, which provides greater availability for determining whether an area was affected by PFAS and is widely used in local labs. In this study, PFAS chemicals were detected and analysed using IR. The researcher tested plant leaf samples from Coral Bells to determine the presence of PFAS in the plant's leaves. The researcher obtained Coral Bell plants, then watered one group with tap water and the other with 300 µL PFAS concentrate mixed with one liter of tap water. After the watering cycles, plant leaves were directly tested for PFAS. Additional leaves were then taken to begin extraction processes. The samples were then evaporated and evaluated for total PFAS chemical content using IR and compared to the PFAS & Water compound. Using Infrared Spectroscopy (IR) methods, we were able to detect PFAS in the samples at around the 13 cm-1 mark in all of the samples tested. This proves that this procedure could make detecting PFAS in PFAS-polluted areas more efficient and cost-effective. This novel method is an alternative to using LC-MS and allowing researchers to detect PFAS in contaminated plant organisms.

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