

Beverages leave 'geographic signatures' that can track people's movements

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Water, beer and other beverages contain natural chemical imprints related to geographic location that may help trace the origin of the drinks or help criminal investigators identify the travels of crime suspects.

The bottled water, soda pop, or micro brew-beer that you drank in Pittsburgh, Dallas, Denver or 30 other American cities contains a natural chemical imprint related to geographic location. When you consume these beverage you may leave a chemical imprint in your hair that could be used to track your travels over time, a new study suggests. The findings, believed to be the first concerted effort to describe the use of beverages as a potential tool to investigate the geographic location of people, appears in ACS' *Journal of Agricultural and Food Chemistry*.

Lesley Chesson and colleagues explain that the body removes hydrogen and oxygen atoms from water (H_2O), and beverages containing water,

and incorporates them into proteins, including the protein in hair. Hydrogen and oxygen exist in different forms, or isotopes. The proportions of those isotopes vary in a predictable way geographically, with higher values in low-latitude, low-elevation, or coastal regions, for instance, and lower values elsewhere. Since manufacturers usually use local or regional water sources in producing beverages, isotope patterns in hair could serve as a chemical "fingerprint" to pinpoint the geographic region where a person has been.

The scientists analyzed isotope patterns in bottled [water](#), soda pop, and beer from 33 cities and found that patterns in the beverages generally matched those already known for the [tap water](#). They noted that the isotope pattern in [beverages](#) tends to vary from city to city in ways that give cities in different regions characteristic "iso-signatures." A person who drinks a beer or soda in Denver, Des Moines, or Dallas, for instance, consumes a different isotope signature than a person in Las Cruces, Las Vegas, or Laramie. The finding may help trace the origin of drinks or help criminal investigators identify the geographic travels of crime suspects and other individuals through analysis of hair strands, the study suggests.

More information: "Links between Purchase Location and Stable Isotope Ratios of Bottled Water, Soda, and Beer in the United States", *Journal of Agricultural and Food Chemistry*.

Provided by American Chemical Society

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