

Sunscreens and tourism: their impact on the environment

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Ultraviolet (UV) filters are widely used in cosmetics, sunscreens, and plastics to block UV radiation from the sun. Studies show that some sunscreens demonstrate estrogenicity and multiple hormonal activities *in vitro*. Because of the high consumption volume and high lipophilicity of sunscreens, these compounds have the potential to enter and persist in the environment and to bioaccumulate in tissues of living organisms.

People from all over the world visit Las Vegas, bringing with them their own medications and personal care products (e.g., cosmetics, sunscreens). To date, there are only 15 U.S. FDA-approved, organic UV filters, while European countries, Australia, and Japan sanction additional compounds. Therefore, target analytes in this work include most of the US-approved UV filters and some filters that are only approved in other countries. This research aims to monitor and evaluate potential sources of exposure of these compounds in different environmental compartments. This presentation includes extraction and analytical methods development and preliminary data.

An extraction method for these compounds in water is being developed in our laboratory. Complementary HPLC-ESI-MS/MS and GC-MS analytical methods were also developed. The former method employed gradient elution and acquired both positive and negative ion data during a single data acquisition. The quantitation ion was the most abundant fragment ion observed using selected reaction monitoring (SRM) for each compound. The collision energy was set to reduce the precursor ion abundance to about 15% of the quantitation ion abundance. The GC-MS method is especially useful for lipophilic compounds.